

CHECKLIST TO DESIGNATE AREAS OF EVALUATION FOR REQUESTS FOR PROPOSAL (RFP)

	REQUISITION NUMBER	DUE DATE	TIME DUE
MDOT PROJECT MANAGER	JOB NUMBER (JN)	CONTROL SECTION (CS)	
DESCRIPTION			

MDOT PROJECT MANAGER: Check all items to be included in RFP WHITE = REQUIRED ** = OPTIONAL Check the appropriate Tier in the box below			CONSULTANT: Provide only checked items below in proposal
<input type="checkbox"/> TIER I (\$50,000 - \$150,000)	<input type="checkbox"/> TIER II (\$150,000-\$1,000,000)	<input type="checkbox"/> TIER III (>\$1,000,000)	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Understanding of Service **
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>Innovations</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Organizational Chart
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Qualifications of Team
Not required as part of Official RFP	Not required as part of Official RFP	<input type="checkbox"/>	Quality Assurance/Quality Control **
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Location: The percentage of work performed in Michigan will be used for all selections unless the project is for on-site inspection or survey activities, then location should be scored using the distance from the consultant office to the on-site inspection or survey activity.
N/A	N/A	<input type="checkbox"/>	Presentation **
N/A	N/A	<input type="checkbox"/>	Technical Proposal (if Presentation is required)
3 pages (MDOT Forms not counted)	7 pages (MDOT Forms not counted)	14 pages (MDOT forms not counted)	Total maximum pages for RFP not including key personnel resumes. Resumes limited to 2 pages per key staff personnel.

PROPOSAL AND BID SHEET EMAIL ADDRESS – mdot-rfp-response@michigan.gov

GENERAL INFORMATION

Any questions relative to the scope of services must be submitted by e-mail to the MDOT Project Manager. Questions must be received by the Project Manager at least five (5) working days prior to the due date and time specified above. All questions and answers will be placed on the MDOT website as soon as possible after receipt of the questions, and at least three (3) days prior to the RFP due date deadline. The names of vendors submitting questions will not be disclosed.

MDOT is an equal opportunity employer and MDOT DBE firms are encouraged to apply. The participating DBE firm, as currently certified by MDOT's Office of Equal Opportunity, shall be listed in the Proposal.

MDOT FORMS REQUIRED AS PART OF PROPOSAL SUBMISSION

5100D – Request for Proposal Cover Sheet

5100J – Consultant Data and Signature Sheet (Required for all firms performing non-prequalified services on this project.)

(These forms are not included in the proposal maximum page count.)

REQUEST FOR PROPOSAL

The Michigan Department of Transportation (MDOT) is seeking professional services for the project contained in the attached scope of services.

If your firm is interested in providing services, please indicate your interest by submitting a Proposal, Proposal/Bid Sheet or Bid Sheet as indicated below. The documents must be submitted in accordance with the latest (Consultant/Vendor Selection Guidelines for Services Contracts) **AA**

AA
.....

RFP SPECIFIC INFORMATION

☐ ENGINEERING SERVICES ☐ BUREAU OF TRANSPORTATION PLANNING ☐ OTHER

THE SERVICE WAS POSTED ON THE ANTICIPATED QUARTERLY REQUESTS FOR PROPOSALS

☐ NO ☐ YES DATED _____ THROUGH _____

☐ **Prequalified Services** – See the attached Scope of Services for required Prequalification Classifications.

☐ **Non-Prequalified Services** – If selected, the vendor must make sure that current financial information, including labor rates, overhead computations, and financial statements, is on file with MDOT's Office of Commission Audits. This information must be on file for the prime vendor and all sub vendors so that the contract will not be delayed. **Form 5100J is required with proposal for all firms performing non-prequalified services on this project.**

☐ **Qualification Based Selection** - Use Consultant/Vendor Selection Guidelines.

For all Qualifications Based Selections, the selection team will review the information submitted and will select the firm considered most qualified to perform the services based on the proposals. The selected firm will be asked to prepare a priced proposal. Negotiations will be conducted with the firm selected.

For a cost plus fixed fee contract, the selected vendor must have a cost accounting system to support a cost plus fixed fee contract. This type of system has a job-order cost accounting system for the recording and accumulation of costs incurred under its contracts. Each project is assigned a job number so that costs may be segregated and accumulated in the vendor's job-order accounting system.

☐ **Qualification Based Selection / Low Bid** – Use Consultant/Vendor Selection Guidelines. See Bid Sheet instructions for additional information.

For Qualification Review/Low Bid selections, the selection team will review the proposals submitted. The vendor that has met established qualification threshold and with the lowest bid will be selected.

☐ **Best Value** – Use Consultant/Vendor Selection Guidelines, See Bid Sheet Instructions below for additional information. The bid amount is a component of the total proposal score, not the determining factor of the selection.

☐ **Low Bid** (no qualifications review required – no proposal required.)

BID SHEET INSTRUCTIONS

Bid Sheet(s) are located at the end of the Scope of Services. Submit bid sheet(s) with the proposal, to the email address: mdot-rfp-response@michigan.gov. Failure to comply with this procedure may result in your bid being rejected from consideration.

AA

PARTNERSHIP CHARTER AGREEMENT

MDOT and ACEC created a Partnership Charter Agreement which establishes guidelines to assist MDOT and Consultants in successful partnering. Both the Consultant and MDOT Project Manager are reminded to review the [ACEC-MDOT Partnership Charter Agreement](#) and are asked to follow all communications, issues resolution and other procedures and guidance's contained therein.

**NOTIFICATION
MANDATORY ELECTRONIC SUBMITTAL**

Proposals submitted for this project must be submitted electronically.

The following are changes to the Proposal Submittal Requirements:

- Eliminated the Following Requirements:
 - Safety Program
 - Communication Plan
 - Past Performance as *a separate section*
 - Separate section for DBE Statement of goals. Include information in Qualification of Team section
- Implemented the Following Changes:
 - All proposals require an Organization Chart
 - Resumes must be a maximum of two pages
 - Only Key (lead) staff resumes may be submitted
 - Tier III proposal reduced from 19 to 14 pages
 - Forms 5100D, 5100I, and 5100G combined – 5100D
 - Forms 5100B and 5100H combined – 5100B
 - RFP's will be posted on a weekly basis -- on Mondays

The following are Requirements for Electronic Submittals:

- Proposals must be prepared using the most current guidelines
- The proposal must be bookmarked to clearly identify the proposal sections (See Below)
- For any section not required per the RFP, the bookmark must be edited to include "N/A" after the bookmark title.
Example: Understanding of Service – N/A
- Proposals must be assembled and saved as a single PDF file
- PDF file must be 5 megabytes or smaller
- PDF file must be submitted via e-mail to MDOT-RFP-Response@michigan.gov
- MDOT's requisition number and company name must be included in the subject line of the e-mail. The PDF shall be named using the following format:
 - Requisition#XXX_Company Name.PDF
- MDOT will not accept multiple submittals
- Proposals must be *received* by MDOT on or before the due date and time specified in each RFP

If the submittals do not comply with the requirements, they may be determined unresponsive.

The Consultant's will receive an e-mail reply/notification from MDOT when the proposal is received. Please retain a copy of this e-mail as proof that the proposal was received on time.
Consultants are responsible for ensuring the MDOT receives the proposal on time.

****Contact Contract Services Division immediately at 517-373-4680 if you do not get an auto response****

Required Bookmarking Format:

- I. Request for Proposal Cover Sheet Form 5100D
 - A. Consultant Data and Signature Sheet, Form 5100J (if applicable)
- II. Understanding of Service
 - A. Innovations
- III. Qualifications of Team
 - A. Structure of Project Team
 - 1. Role of Firms
 - 2. Role of Key Personnel
 - B. Organization Chart
 - C. Location
- IV. Quality Assurance / Quality Control Plan
- V. Resumes of Key Staff
- VI. Pricing Documents/Bid Sheet (if applicable)

2/14/12

NOTIFICATION E-VERIFY REQUIREMENTS

E-Verify is an Internet based system that allows an employer, using information reported on an employee's Form I-9, Employment Eligibility Verification, to determine the eligibility of that employee to work in the United States. There is no charge to employers to use E-Verify. The E-Verify system is operated by the Department of Homeland Security (DHS) in partnership with the Social Security Administration. E-Verify is available in Spanish.

The State of Michigan is requiring, under Public Act 200 of 2012, Section 381, that as a condition of each contract or subcontract for construction, maintenance, or engineering services that the pre-qualified contractor or subcontractor agree to use the E-Verify system to verify that all persons hired during the contract term by the contractor or subcontractor are legally present and authorized to work in the United States.

Information on registration for and use of the E-Verify program can be obtained via the Internet at the DHS Web site: <http://www.dhs.gov/E-Verify>.

The documentation supporting the usage of the E-Verify system must be maintained by each consultant and be made available to MDOT upon request.

It is the responsibility of the prime consultant to include the E-Verify requirement documented in this NOTIFICATION in all tiers of subcontracts.

9/13/12

Michigan Department of Transportation
SCOPE OF SERVICE
FOR
DESIGN
INTELLIGENT TRANSPORTATION SYSTEMS
Infrastructure and Network Services

CONTROL SECTION(S): 84900

JOB NUMBER(S): JN127634, JN124622, JN113523

PROJECT LOCATION:

Various locations throughout Michigan Department of Transportation (MDOT) Bay, Grand, Metro, North, Southwest, Superior, and University Regions.

DESCRIPTION OF WORK:

Complete Intelligent Transportation Systems (ITS) infrastructure and network services in all of the seven MDOT Regions. ITS infrastructure is currently installed or planned to be installed in the counties specified per each MDOT Region below.

Bay Region – Arenac, Bay, Clare, Genesee, Isabella, Midland, Saginaw, and St. Clair Counties

Metro Region – Oakland, Macomb, and Wayne Counties

University Region – Clinton, Ingham, Jackson, Livingston, Monroe, and Washtenaw Counties

Grand Region – Allegan, Ionia, Kent, Muskegon, and Ottawa Counties

Southwest Region – Berrien, Calhoun, Cass, Kalamazoo, and Van Buren Counties

North Region – Cheboygan, Crawford, Emmet, Ogemaw, Otsego, and Roscommon Counties

Superior Region – Alger, Chippewa, Delta, Mackinac, and Marquette Counties

The Vendor will also maintain ITS Infrastructure for the Mackinac Bridge Authority (MBA) and Blue Water Bridge (BWB) and possibly the International Bridge Authority (IBA). Some counties included in the above list are maintained via direct MDOT forces (Delta County) or city forces (Kent County) and are included for informational purposes only.

All work to be performed shall be done in accordance with the Michigan Department of Transportation's 2012 Standard Specifications for Construction; the 2011 Michigan Manual on Uniform Traffic Control Devices; all applicable national, state and local building and electrical codes; and all applicable national, state, and local worker safety

policies.

ITS devices to be and not to be maintained under the contract have been identified in **ATTACHMENT A - Current System Description.**

PRIMARY PREQUALIFICATION CLASSIFICATION(S): N/A

SECONDARY PREQUALIFICATION CLASSIFICATION(S): N/A

ANTICIPATED START DATE: April 1, 2016

ANTICIPATED COMPLETION DATE: March 31, 2019

DBE REQUIREMENT: There is no DBE requirement for this project.

PREFERRED QUALIFICATIONS:

The Vendor shall have five related projects in the areas of ITS Maintenance, ITS Integration, and ITS Network Management working with state government or local municipalities over the past five years.

The Vendor shall have a licensed electrician on staff.

The Vendor shall have staff with or be prepared to equip staff with the following applicable certifications prior to the start of the Contract:

- Cisco Certified Network Professional (CCNP)
- Alcatel Certified Field Expert (ACFE)
- Alcatel Certified Switch Expert (ACSE)
- Registered Communications Distribution Designer (RCDD)
- Professional Engineer (PE)
- Solarwinds Certified Professional (SCP)
- BICSI ITS Technician Certification
- BICSI Installer 2, Optical Fiber
- Honeywell Pro-Watch
- Tower Climbing Safety and Rescue
- Confined Space Training

MDOT PROJECT MANAGER:

Elise Feldpausch

Michigan Department of Transportation

8885 Ricks Rd.

P.O. Box 30049

Lansing, MI, 48917

517-636-0036

FeldpauschE1@michigan.gov

The Vendor shall contact the Project Manager prior to beginning any work on the project.

REQUIRED MDOT GUIDELINES AND STANDARDS:

Work shall conform to current MDOT, FHWA, and AASHTO practices, guidelines, policies, and standards (i.e., Road Design Manual, Bridge Design Manual, Standard Plans, Drainage Manual, Roadside Design Guide, A Policy on Geometric Design of Highways and Streets, Michigan Manual of Uniform Traffic Control Devices, 2012 Standard Specifications for Construction, the Design Survey Manual, Maintaining Traffic Typical, etc.).

BACKGROUND:

The Vendor shall have direct ITS maintenance, installation, and network management experience with the following device types (a complete list of all device makes and models can be seen in Appendix D):

- Closed Circuit Television System (CCTV)
- Dynamic Message Signs (DMS)
- Microwave Vehicle Detection System (MVDS)
- Border Wait Time Systems
- Truck Parking Information and Management System (TPIMS)
- Dynamic Truck Parking Signs (DTPS)
- Environmental Sensors
- Highway Advisory Radio (HAR)
- Dedicated Short Range Communication Road Side Units(DSRC RSU)
- Travel Time Signs
- Curve Warning Systems
- Video Wall Systems Management Software
- Licensed/Unlicensed Wireless Radios
- Wimax
- Fiber Optic – Course Wavelength Division Multiplexing (CWDM)
- IP Networking
 - Subnetting
 - Layer 2/Layer 3
 - Multicasting
 - Internet Protocol (IP)v4 and IPv6
 - Virtual LAN (VLAN)s
 - Security and Firewalls
 - Design

The Vendor shall furnish all services and labor necessary to conduct and complete the services described herein. The Vendor shall also furnish all materials, equipment, supplies, and incidentals necessary to perform the services (other than those designated in writing to be furnished by the Department) and check and/or test the materials, equipment, supplies, and incidentals as necessary in carrying out this work. The services shall be performed to the satisfaction of the Department consistent with applicable professional standards.

The Vendor shall comply with all applicable Federal and State laws, rules, and regulations. The Vendor staff shall conduct themselves with professionalism in carrying out their duties.

The Vendor shall notify the Project Manager, in writing, prior to any personnel changes from those specified in the Vendor's original approved proposal. Any personnel substitutions are subject to review and approval of the Project Manager.

At the request of the Department, the Vendor, during the progress of the Services, shall furnish information or data relating to the Services described herein. These may be required by the Department to enable it to carry out or to proceed with related phases of the Project not described herein, or which may be necessary to enable the Department to furnish information to the Vendor upon which to proceed with further Services.

VENDOR RESPONSIBILITIES:

Project Description

Comprehensive response and preventative maintenance services are required to keep Michigan's ITS infrastructure in proper working order. This will include all labor, equipment, tools, and materials necessary to maximize system availability and efficiency.

Maintenance services for additional elements that are fundamentally similar to elements included in the original contract will be incorporated into the contract at existing bid prices upon notification by the Project Manager (Engineer). These elements will be included in the contract within ten business days after notification by the Engineer, during which time the Vendor will have the right to inspect new elements prior to inclusion in the maintenance contract. If the Vendor chooses not to inspect the new elements, they will become automatically included in the contract after ten business days have elapsed. Deficiencies in workmanship of the new elements, as noted by the Vendor, will be resolved prior to inclusion in the contract. The device(s) shall be added on the day of completion of inspection or at the close of the ten day exception window if the Vendor waives the inspection.

Maintenance services for any field elements may be removed from the contract by notification of the Engineer. In such case, the next business day after notice of removal from the contract is provided by the Engineer, the field elements being removed will no longer be the responsibility of the Vendor and the corresponding pay item quantity will be reduced. This may occur for a variety of reasons, including but not limited to decommissioned devices and devices temporarily taken out of service due to construction projects.

Maintenance services for additional elements that are not similar to existing elements may be added to the contract through a mutually agreed upon contract modification.

General Requirements for ITS Field Devices

The Vendor shall provide all labor to maximize system availability and efficiency of the MDOT ITS Network. The Vendor shall obtain, maintain, and achieve a minimum operational rate of 90 percent per equipment type per MDOT Region. For example, a 90 percent operational rate must be maintained for all DMS equipment in MDOT Superior

Region. Failure to achieve and maintain a 90 percent operational rate (excluding Third Party Damage & Acts-of-God) may be cause for termination of this agreement. Operation will be defined as operating as intended, designed, or previously modified. The Engineer will be the final authority regarding the operational status of field equipment.

The Vendor is responsible for coordinating with the appropriate warranty company for all devices that are under warranty. The Vendor shall contact the warranty company within a predetermined amount of time as defined in the Response and Repair Time section of this RFP. Reasonable effort must be shown in contacting and prompting the warranty company to repair the device in a quick and timely manner. The Engineer will be the final authority regarding the operational status of field equipment.

The Vendor is responsible for maintaining power infrastructure at each site on the MDOT side of the meter. Any work required on the utility company side of the meter, including the meter, shall be performed by the utility company with associated costs paid by MDOT directly to the utility company or at cost to the utility company depending on the situation.

Loops that are not operational due to failure on the travel lane side of the handhole in the shoulder shall be excluded from the operational rate calculation for the purpose of calculating system availability. Equipment that has been removed from the contract by notification of the Engineer shall be excluded from the operational rate calculation, including but not limited to decommissioned devices and devices involvement in current construction projects.

Spare parts inventory will be owned by MDOT, maintained in an insured secure environment by the Vendor, and available for audit by MDOT. The Vendor will be reimbursed on an actual cost basis for replacement spare parts to maintain an adequate inventory.

The Vendor shall provide and anticipate utilizing appropriate bucket-trucks and all other equipment as needed to perform the services defined herein.

DESCRIPTION OF WORK

Under this scope, the Vendor shall provide 36 months of maintenance services on the following components of the MDOT ITS infrastructure. The specifications for maintenance of each type of ITS device site are listed.

ITS Devices and Communications Equipment

The Vendor shall provide maintenance for, but not limited to magnetometer/point detection, MVDS, video, and radar vehicle detectors, DMS, CCTV cameras, TTS, communications system (licensed and unlicensed wireless radios, fiber optic cable, cellular modems, etc.), Truck Parking Information and Management System (TPIMS), Border Wait Time devices, DSRC RSUs, Solarwinds Monitoring Software, mechanical equipment in the shelters (compressors, generators, etc.), and applicable TOC communications equipment and display (video wall and controller, etc.). A full description of all current device makes and models can be found in Attachment D.

The Vendor shall maintain and utilize Solarwinds as well as provide access to MDOT employees as designated.

The Vendor shall also utilize the MDOT ITS Asset Management Database (AMD) to receive, work off of, and respond to work orders from the TOCs, maintain an accurate spare parts inventory, transfer devices from warehouse to site, etc. Training will be made available at the request of the selected Vendor if unfamiliar with the database prior to the start of the contract, the expectation being that the Vendor will be proficient with the use of the AMD.

The Vendor shall also provide maintenance for MDOT's complex communications network that has been deployed under multiple contracts using different technologies. The network is a combination of leased and MDOT owned infrastructure. The MDOT leased/owned network consists of wireless and wire-line systems. The communications network is critical to the Southeast Michigan Transportation Operations Center (SEMTOC) in Detroit, the West Michigan Transportation Operations Center (WMTOC) in Grand Rapids, and the Statewide Transportation Operations Center (STOC) in Lansing, as well as other existing and future standalone ITS throughout the state. Failure of the network could cause the loss of significant field equipment access and its repair and maintenance must be of highest priority. Although failure repair time is difficult to predict, the selected Vendor will be required to update the Engineer hourly and/or daily on maintenance/repair progress, or as requested by the Engineer. Failure to meet any requirement of the contract may be grounds for contract termination.

Maintaining a strong network security will also be an important component under this Contract for all device types. This shall include but not be limited to the proper changing of usernames and passwords and the monitoring of proper access by outside parties to the ITS Network at all locations. The National Institute of Standards and Technology should be referenced for proper protocols as well as any additional protocols as determined by the Department of Technology Management and Budget. Aspects of this may be modified or removed as a result of any new Video Sharing Contract solutions in the future or as determined by the Engineer.

Networking support will also be required and will consist of providing support, fixes, patches, and repairs to the network; as well as network guidance and compliance for projects that are tying into the current network as requested by the Engineer.

During the duration of the contract, the Vendor shall provide all labor, tools, equipment, and minor materials, including, but not limited to, jumper wires, connectors, or any wiring that is completely within a single cabinet, to maintain the system and maximize system availability and efficiency. More significant spare parts will come from a spare parts inventory to be purchased, managed, and maintained by the Vendor.

Preventative Maintenance

The Vendor shall conduct preventative maintenance to all ITS devices maintained as a part of this Contract. The Vendor shall provide all personnel, test equipment, and all other items for preventative maintenance during the contract. In addition, the Vendor shall also be responsible for notifying the Engineer when the generators within the shelter require

refueling, so that fuel can be ordered prior to emptying.

The Vendor must develop and submit a Preventative Maintenance Plan (PMP). The PMP must be comprehensive and address all items in sufficient detail, including time durations. Consideration must be giving to the overall contract length as it pertains to and affects device preventative maintenance. The Vendor shall adhere to all submitted and approved preventative maintenance activities and schedules.

Routine and Emergency Maintenance Service Requirements

The Vendor shall provide all personnel, test equipment, and all other items for remedial maintenance during the period of the contract. The Vendor will be reimbursed at cost for replacement spare parts to maintain an adequate inventory. The Vendor shall anticipate utilizing appropriate bucket-trucks and traffic control equipment for shoulder closures, during hours approved by MDOT.

As required to maintain the system properly, the Vendor shall provide an on-call professional Project Manager for the maintenance/administration of the TOC hardware. They will provide technical expertise, direction, and strategies regarding all aspects of TOC maintenance, operation, and/or improvements as follows:

- The Project Manager or designee shall be available to the Engineer 24 hours a day, seven days a week through phone, pager, email, or other means.
- The Project Manager or designee shall participate in bi-weekly coordination meetings with MDOT, Department of Technology, Management & Budget (DTMB), and other contract personnel, as specified by the Engineer.

Coordination with MDOT Offices

The Vendor shall coordinate with the Engineer for all items to ensure statewide consistency. Day to day activities may be delegated to the predetermined Regional ITS Representative as designated by the Engineer. The Engineer may delegate some coordination activities to others. The Vendor shall notify the Engineer when any work involving coordination with other MDOT offices occurs and issues arise.

Coordination with Maintenance Organizations in Delta and Kent County

All maintenance work within Delta and Kent counties will be completed by their own forces however coordination with MDOT maintenance forces in Delta County and city maintenance forces in Kent County may be required on certain instances including but not limited to doing work near county lines.

Coordination with Other Vendors

Other contracts that increase or decrease field equipment quantities, expand the communication network, and/or develop/integrate software device drivers to control additional equipment will be awarded, under construction, and completed during the life of this maintenance contract. The Vendor shall be responsible for coordinating with the Engineer and other Vendors, efforts related to these other contracts to ensure that access to SEMTOC, WMTOC, STOC, and other statewide ATMS field devices is not the cause of construction, design delays, or claims. The Vendor shall also be

responsible for any adjustments that need to be made to the current network or device configurations to allow the new equipment to be added in. Additional meetings may also be required to ensure optimal coordination of projects. In the event that outside Vendor(s) perform similar work, either through warranty services for new devices added under separate contract(s) or through award of non-routine maintenance work, the Vendor shall coordinate with outside Vendor(s). The Vendor may also be required to assist other Vendors with integration of future projects as requested by the Engineer. The coordination necessary under this requirement will consist of ensuring that access to sites is provided and associated coordination correspondence and communication occurs. The Vendor shall be responsible for assisting the Engineer with any Requests for Information (RFIs) to may occur during the duration of the contract.

If work performed by another Vendor, either installation, warranty, non-routine, or road work construction, requires remedial action directed by the Engineer, then that remedial work shall be performed in accordance with the requirements defined under Non-Routine Maintenance.

Cellular Telephones

Each key Vendor staff member as defined in the contract, as well as a minimum of one member of each work crew or team, shall be equipped with a cellular telephone and shall keep that telephone on hand at all times while working on this project.

Asset Management Database

The Vendor will be required to work with the ITS Asset Management Database (AMD) as specified by the Engineer and input all work performed on any field elements, including notes on adjustments or parts replaced during maintenance and conditions discovered through inspection. In addition, required repairs will be transmitted to the Vendor through work orders issued through the AMD and the repair will not be considered complete until properly documented in the database. Maintenance of the MDOT ITS field elements inventory in the AMD will be completed by the Vendor, including the addition of field elements as they become operational, as well as element removal. All newly added field elements will conform to the current MDOT naming conventions for ITS infrastructure. The Vendor shall also work with MDOT and their designee to ensure compatibility between Solarwinds and the AMD together. The Engineer or his/her designee has the authority to inspect all work performed by the Vendor and review and reject work orders; any rejected work order shall be documented by the Engineer with notification to the Vendor within two business days. It will be the responsibility of the Vendor as part of the preventative maintenance actions for each device to ensure the information in the AMD is accurate including but not limited to: serial number, accessibility, firmware version, make, and model.

Solarwinds

Office Space

MDOT will provide office space for one Vendor staff member at a MDOT building if the locations are determined to be necessary for contract compliance by the Engineer. This space will include one telephone, one personal computer connected to the State of

Michigan (SOM) network, and access to a fax machine/printer/copier. In addition, MDOT will provide shop space at a MDOT designated/approved facility for the awarded Vendor's use. The office space, telephone, personal computer, fax machine, and copy machine are all for project use only. Any costs for non-project related uses will be deducted from money due the Vendor.

Personal Computer

The provided personal computer will be connected to the SOM network and the Vendor Project Manager will be provided with a MDOT email address. This email address shall be used for all project related communications and only for project related communications. Additional personal computers, including laptops, required to perform the work described herein shall be provided by the Vendor. No payment will be made to the Vendor for costs associated with these computers or related services and equipment.

Installed Material

All compensation for work performed under the contract will be through the bid items included. No additional compensation will be made for any labor, equipment, or tools except as described for non-routine maintenance services. Minor materials such as wiring, fasteners, connectors, jumpers, or other cables contained within a single cabinet, will be included in the pay items included in the contract. If material originates from the inventory warehouse, the Vendor will be compensated on an actual cost basis for replacing the spare parts inventory.

Equipment

All compensation for equipment used for work under the contract will be through the bid items included. No additional compensation will be made for any labor, equipment, or tools except as described for non-routine maintenance services.

Response and Repair Time

The maximum response times to report to a problem site, diagnose the problem, prepare an action plan, and if possible, repair the problem shall be determined according to the severity of the problem, as described below.

The Vendor shall have a representative assigned to a location that will allow them to respond to the incidents within the appropriate response time, as described below.

The severity of the issue will initially be determined by the operators of the various Traffic Operations Centers or the Region ITS Representatives, however the Engineer will have final determination regarding classification of the severity of the problem as described below. The severity classifications and response times do not impact payment schedules and will not be interpreted as extending or altering repair times for the purposes of determining payment.

Failure to comply with the time frames described below may result in termination of the contract. The severity of the problem and the maximum response times will be defined as follows:

HIGH SEVERITY – High Severity problems are defined as those that cause approximately ten percent or more of all ITS equipment per MDOT Region to become dysfunctional, create a safety concern, or create a significant inconvenience to the traveling public. A safety concern may be due to hazards caused directly by malfunctioning or damaged ITS equipment, such as a damaged equipment support or bracket, or due to hazards caused indirectly by malfunctioning ITS equipment, such as a malfunctioning CCTV camera or DMS in an area impacted by traffic generated by a major special event. Maximum response time for a High Severity problem, from initial work order dissemination, contact from the Regional ITS Representative or Engineer or designee to reporting to the site, shall be **four hours**. Within that time, a representative of the Vendor shall be on site, reported to the Engineer, and provided a summary of the problem. After an additional two hours, the Vendor shall prepare an action plan, including estimated time to repair and a cost estimate to repair the problem if it does not fall under the normal scope of the contract. This communication shall initially be provided to the Engineer or designee verbally and re-iterated in writing by e-mail or hard copy no later than 10:00 AM the following business day.

MEDIUM SEVERITY – Medium Severity problems are defined as those that cause critical components of the ITS to become inoperable. Critical components of the ITS may be defined differently at different times of the contract depending on special traffic patterns due to special events, adjacent construction or maintenance activities, or holidays. Maximum response time for a Medium Severity problem, from initial work order dissemination, contact from the Regional ITS Representative or Engineer or designee to reporting to the site, shall be **twenty-four hours**. Within that time, a representative of the Vendor shall be on site and shall have reported to the Engineer and provided a summary of the problem. After an additional two hours, the Vendor shall prepare an action plan, including estimated time to repair, and a cost estimate to repair the problem if it does not fall under the normal scope of the contract. This communication shall initially be provided to the Engineer or designee verbally and re-iterated in writing by e-mail or hard copy no later than 10:00 AM the following business day.

LOW SEVERITY – Low Severity problems are all problems not identified as High Severity or Medium Severity as defined above. Maximum response time for a Low Severity problem shall be **two business days** from initial contact from the Engineer. Within that time, a representative of the Vendor shall be on site, reported to the Engineer, and provided a summary of the problem, an action plan, including estimated time to repair, and a cost estimate to repair the problem, if it does not fall under the normal scope of the contract. This communication shall initially be provided to the Engineer or designee verbally and re-iterated in writing by e-mail or hard copy no later than 10:00 AM the following business day.

Exceptions to the Response and Repair Timelines

Blue Water Bridge and Mackinaw Bridge

All responsibilities apply with the above description however there will need to be

additional coordination with both the Mackinaw Bridge Authority and Blue Water Bridge TOC which may or may not result in the deferral of repairs at the request of the Bridges.

Relationship between Pay Items

In the event that the inoperability of a field element is due to the failure of a separate system, payment will be withheld for maintenance of both systems.

Example: If a communications system failure causes the inoperability of multiple CCTV, DMS, and Detector sites, then the CCTV, DMS, and Detector sites as well as the communications system will not be considered operational until the communications system is repaired and the sites are fully operational.

MDOT RESPONSIBILITIES (GENERAL):

- A. Schedule and/or conduct the following:
 - 1. Project related meetings
 - 2. Stakeholder engagement meetings
- B. Make decisions or provide input for the following items:
 - 1. Resolve issues related to funding
 - 2. Review and approve all budget and schedule aspects

TRAFFIC CONTROL

The Vendor shall be responsible for all traffic control required to perform the tasks as outlined in this Project Scope of Design Services, unless worked out in advance with the Engineer or Regional ITS Representative. Coordination with others' lane closures is allowable, provided it is at no cost to MDOT and response/repair timeframes can be met.

PROJECT MANAGEMENT:

This project will require close interaction and good communication between the Vendor and MDOT.

If there are any major deviations from the original scope of this assignment, these changes must be documented and jointly approved by the Vendor and MDOT.

The selected Vendor shall provide all necessary project management services, including at a minimum monthly and quarterly progress reports and providing invoices in a timely manner.

Vendors shall provide a description of their management team for this project and list all key personnel responsible for the deliveries of this proposal.

STATUS REPORTS/ MEETINGS:

There will be periodic, regular meetings between MDOT representatives and the selected Vendor to review work product and to communicate progress, issues, ideas, and expectations, as determined necessary to complete the services as approved by MDOT.

The selected Vendor shall provide copies of all project reports, correspondence, meeting announcements, and meeting minutes for all meetings attended, which shall be delivered by email to the MDOT Project Manager.

PROJECT DOCUMENTATION:

All documentation and reports shall be delivered in the current version of Microsoft Word or Adobe Acrobat (whichever applies) being used by MDOT. All documentation delivered shall be clear, concise, complete, and in compliance with standards required by the MDOT Project Manager.

The Vendor shall establish and maintain its own document control system (DCS) to store and record all correspondence, design inputs, drawings, progress reports, technical reports, specifications, Contract Documents, submittals, calculations, test results, inspection reports, nonconformance reports, administrative documents, and other documents generated under the Contract. This DCS must be accessible via a username and password protected secure website by MDOT personnel and Vendors as needed.

BID TABULATIONS:

The price proposal shall be completed in the format contained on the following [bid tabulation sheets for Statewide MDOT ITS Maintenance](#). All costs shall be in U.S. dollars.

VENDOR PAYMENT – Unit Price and Lump Sum:

Compensation for this project shall be on a **unit price** basis. This basis of payment typically includes a maximum quantity of units and a maximum reimbursable cost per unit.

All billings for services must be directed to the Department and follow the current guidelines. Payment may be delayed or decreased if the instructions are not followed.

Payment to the Consultant for services rendered shall not exceed the maximum amount unless an increase is approved in accordance with the contract with the Consultant. Typically, billings must be submitted within 60 days after the completion of services for the current billing. The final billing must be received within 60 days of the completion of services. Refer to your contract for your specific contract terms.

Compensation for this project shall be on a **lump sum** basis. One lump sum payment will be made once the deliverable is received and approved by the MDOT Project Manager. The MDOT Project Manager may authorize partial payment if the project is delayed due to circumstances beyond the consultant's control.

All billings for services must be directed to the Department and follow the current guidelines. Payment may be delayed or decreased if the instructions are not followed.

Payment to the Consultant for services rendered shall not exceed the maximum amount unless an increase is approved in accordance with the contract with the Consultant. Typically, billings must be submitted within 60 days after the completion of services. Refer to your contract for your specific contract terms.

INTELLIGENT TRANSPORTATION SYSTEMS
INFRASTRUCTURE MAINTENANCE
MDOT STATEWIDE
2016

PAYMENT ITEMS

**ALL ENTRIES MADE ON THIS PAGE SHALL BE HANDWRITTEN IN INK.
CHECK UNIT PRICE COLUMN FOR OMISSIONS BEFORE ENTERING BID TOTAL**

ITEMS OF WORK		UNIT	QUANTITY	PRICE/UNIT	TOTAL PRICE
1	Maintain CCTV Site (470 Sites)	Calendar Day	171,550		
2	Maintain DMS Site (184 Sites)	Calendar Day	67,160		
3	Maintain Detector Station Site (474 Sites)	Calendar Day	173,010		
4	Maintain Travel Time Sign Site (6 Sites)	Calendar Day	2,190		
5	Maintain Speed and Curve Warning System (6 Sites)	Calendar Day	2190		
6	Maintain TPIMS Site (5 Sites)	Calendar Day	1,825		
7	Maintain DTPS Site (5 Sites)	Calendar Day	1,825		
8	Maintain DSRC RSU Sites (297 Sites)	Calendar Day	108,405		
9	Maintain Border Wait Time Devices (1 Site)	Calendar Day	365		
10	Maintain ICM DTBP Sites (14 Sites)	Calendar Day	5,110		
11	Maintain SEMTOC Equipment	Dollar	65,000		
12	Maintain STOC Equipment	Dollar	32,500		
13	Maintain Solarwinds Monitoring Software	Calendar Day	365		
14	Solarwinds License Renewal	Each	1		
15	Maintain Spare Parts Inventory	Calendar Day	365		
16	Networking Support	Hour	520		
17	Non-routine Maintenance and Repairs	Dollar	325,000		
18	Spare Parts Direct Cost	Dollar	1,250,000		
19	Utility Staking and Protection One Person	Hour	450		
20	Blue Water Bridge - Maintain CCTV Site (66 sites)	Calendar Day	24,090		

21	Blue Water Bridge – Maintain Badge Reader (81 Sites)	Calendar Day	29,565		
22	Blue Water Bridge – Maintain Door Jam Lock (99 Sites)	Calendar Day	36,135		
23	Blue Water Bridge – Maintain Door Position Sensor (158 Sites)	Calendar Day	57,670		
24	Blue Water Bridge – Maintain Motion Sensor (95 Sites)	Calendar Day	34,675		
25	Blue Water Bridge – Maintain Vibration/Acoustic Sensor (6 Sites)	Calendar Day	2,190		
26	Blue Water Bridge – Maintain Telephone Unit (3 Sites)	Calendar Day	1,095		
27	Blue Water Bridge – Maintain Intercom Unit (7 Sites)	Calendar Day	2,555		
28	Blue Water Bridge – Maintain Loudspeaker (6 Sites)	Calendar Day	2,190		
29	Blue Water Bridge – Maintain Gate Closure Sensor (12 Sites)	Calendar Day	4,380		
30	Blue Water Bridge – Maintain Digital Keypad (1 Site)	Calendar Day	365		
31	Blue Water Bridge – Spare Parts Direct Cost	Dollar	200,000		
32	Blue Water Bridge – Non-Routine Maintenance	Dollar	125,000		
33	Mackinaw Bridge - Non-Routine Maintenance	Dollar	200,000		
34	Mobilization, Max.	Lump Sum	1		

Bid Price for the above listed items and quantities:

\$ _____

VENDOR'S NAME: _____

VENDOR'S SIGNATURE: _____

DATE: _____

INTELLIGENT TRANSPORTATION SYSTEMS
INFRASTRUCTURE MAINTENANCE
MDOT STATEWIDE
2017

PAYMENT ITEMS

**ALL ENTRIES MADE ON THIS PAGE SHALL BE HANDWRITTEN IN INK.
CHECK UNIT PRICE COLUMN FOR OMISSIONS BEFORE ENTERING BID TOTAL**

ITEMS OF WORK		UNIT	QUANTITY	PRICE/UNIT	TOTAL PRICE
1	Maintain CCTV Site (492 Sites)	Calendar Day	179,580		
2	Maintain DMS Site (189 Sites)	Calendar Day	68,985		
3	Maintain Detector Station Site (482 Sites)	Calendar Day	175,930		
4	Maintain Travel Time Sign Site (6 Sites)	Calendar Day	2,190		
5	Maintain Speed and Curve Warning System (6 Sites)	Calendar Day	2190		
6	Maintain TPIMS Site (5 Sites)	Calendar Day	1,825		
7	Maintain DTPS Site (5 Sites)	Calendar Day	1,825		
8	Maintain DSRC RSU Sites (427 Sites)	Calendar Day	155855		
9	Maintain Border Wait Time Devices (1 Site)	Calendar Day	365		
10	Maintain ICM DTBP Sites (26 Sites)	Calendar Day	9,490		
11	Maintain SEMTOC Equipment	Dollar	68,250		
12	Maintain STOC Equipment	Dollar	34,125		
13	Maintain Solarwinds Monitoring Software	Calendar Day	365		
14	Solarwinds License Renewal	Each	1		
15	Maintain Spare Parts Inventory	Calendar Day	365		
16	Networking Support	Hour	520		
17	Non-routine Maintenance and Repairs	Dollar	341,250		
18	Spare Parts Direct Cost	Dollar	1,312,500		
19	Utility Staking and Protection One Person	Hour	450		
20	Blue Water Bridge - Maintain CCTV Site (66 sites)	Calendar Day	24,090		

21	Blue Water Bridge – Maintain Badge Reader (81 Sites)	Calendar Day	29,565		
22	Blue Water Bridge – Maintain Door Jam Lock (99 Sites)	Calendar Day	36,135		
23	Blue Water Bridge – Maintain Door Position Sensor (158 Sites)	Calendar Day	57,670		
24	Blue Water Bridge – Maintain Motion Sensor (95 Sites)	Calendar Day	34,675		
25	Blue Water Bridge – Maintain Vibration/Acoustic Sensor (6 Sites)	Calendar Day	2,190		
26	Blue Water Bridge – Maintain Telephone Unit (3 Sites)	Calendar Day	1,095		
27	Blue Water Bridge – Maintain Intercom Unit (7 Sites)	Calendar Day	2,555		
28	Blue Water Bridge – Maintain Loudspeaker (6 Sites)	Calendar Day	2,190		
29	Blue Water Bridge – Maintain Gate Closure Sensor (12 Sites)	Calendar Day	4,380		
30	Blue Water Bridge – Maintain Digital Keypad (1 Site)	Calendar Day	365		
31	Blue Water Bridge – Spare Parts Direct Cost	Dollar	210,000		
32	Blue Water Bridge – Non-Routine Maintenance	Dollar	131,250		
33	Mackinaw Bridge - Non-Routine Maintenance	Dollar	200,000		
34	Mobilization, Max.	Lump Sum	1		

Bid Price for the above listed items and quantities:

\$ _____

VENDOR'S NAME: _____

VENDOR'S SIGNATURE: _____

DATE: _____

INTELLIGENT TRANSPORTATION SYSTEMS
INFRASTRUCTURE MAINTENANCE
MDOT STATEWIDE
2018

PAYMENT ITEMS

**ALL ENTRIES MADE ON THIS PAGE SHALL BE HANDWRITTEN IN INK.
CHECK UNIT PRICE COLUMN FOR OMISSIONS BEFORE ENTERING BID TOTAL**

ITEMS OF WORK		UNIT	QUANTITY	PRICE/UNIT	TOTAL PRICE
1	Maintain CCTV Site (506 Sites)	Calendar Day	184,690		
2	Maintain DMS Site (203 Sites)	Calendar Day	74,095		
3	Maintain Detector Station Site (490 Sites)	Calendar Day	178,850		
4	Maintain Travel Time Sign Site (6 Sites)	Calendar Day	2,190		
5	Maintain Speed and Curve Warning System (6 Sites)	Calendar Day	2190		
6	Maintain TPIMS Site (5 Sites)	Calendar Day	1,825		
7	Maintain DTPS Site (5 Sites)	Calendar Day	1,825		
8	Maintain DSRC RSU Sites (427 Sites)	Calendar Day	155,855		
9	Maintain Border Wait Time Devices (1 Site)	Calendar Day	365		
10	Maintain ICM DTBP Sites (26 Sites)	Calendar Day	9,490		
11	Maintain SEMTOC Equipment	Dollar	71,663		
12	Maintain STOC Equipment	Dollar	35,831		
13	Maintain Solarwinds Monitoring Software	Calendar Day	365		
14	Solarwinds License Renewal	Each	1		
15	Maintain Spare Parts Inventory	Calendar Day	365		
16	Networking Support	Hour	520		
17	Non-routine Maintenance and Repairs	Dollar	358,313		
18	Spare Parts Direct Cost	Dollar	1,378,125		
19	Utility Staking and Protection One Person	Hour	450		
20	Blue Water Bridge - Maintain CCTV Site (66 sites)	Calendar Day	24,090		

21	Blue Water Bridge – Maintain Badge Reader (81 Sites)	Calendar Day	29,565		
22	Blue Water Bridge – Maintain Door Jam Lock (99 Sites)	Calendar Day	36,135		
23	Blue Water Bridge – Maintain Door Position Sensor (158 Sites)	Calendar Day	57,670		
24	Blue Water Bridge – Maintain Motion Sensor (95 Sites)	Calendar Day	34,675		
25	Blue Water Bridge – Maintain Vibration/Acoustic Sensor (6 Sites)	Calendar Day	2,190		
26	Blue Water Bridge – Maintain Telephone Unit (3 Sites)	Calendar Day	1,095		
27	Blue Water Bridge – Maintain Intercom Unit (7 Sites)	Calendar Day	2,555		
28	Blue Water Bridge – Maintain Loudspeaker (6 Sites)	Calendar Day	2,190		
29	Blue Water Bridge – Maintain Gate Closure Sensor (12 Sites)	Calendar Day	4,380		
30	Blue Water Bridge – Maintain Digital Keypad (1 Site)	Calendar Day	365		
31	Blue Water Bridge – Spare Parts Direct Cost	Dollar	220,500		
32	Blue Water Bridge – Non-Routine Maintenance	Dollar	137,813		
33	Mackinaw Bridge - Non-Routine Maintenance	Dollar	200,000		
34	Mobilization, Max.	Lump Sum	1		

Bid Price for the above listed items and quantities:

\$ _____

VENDOR'S NAME: _____

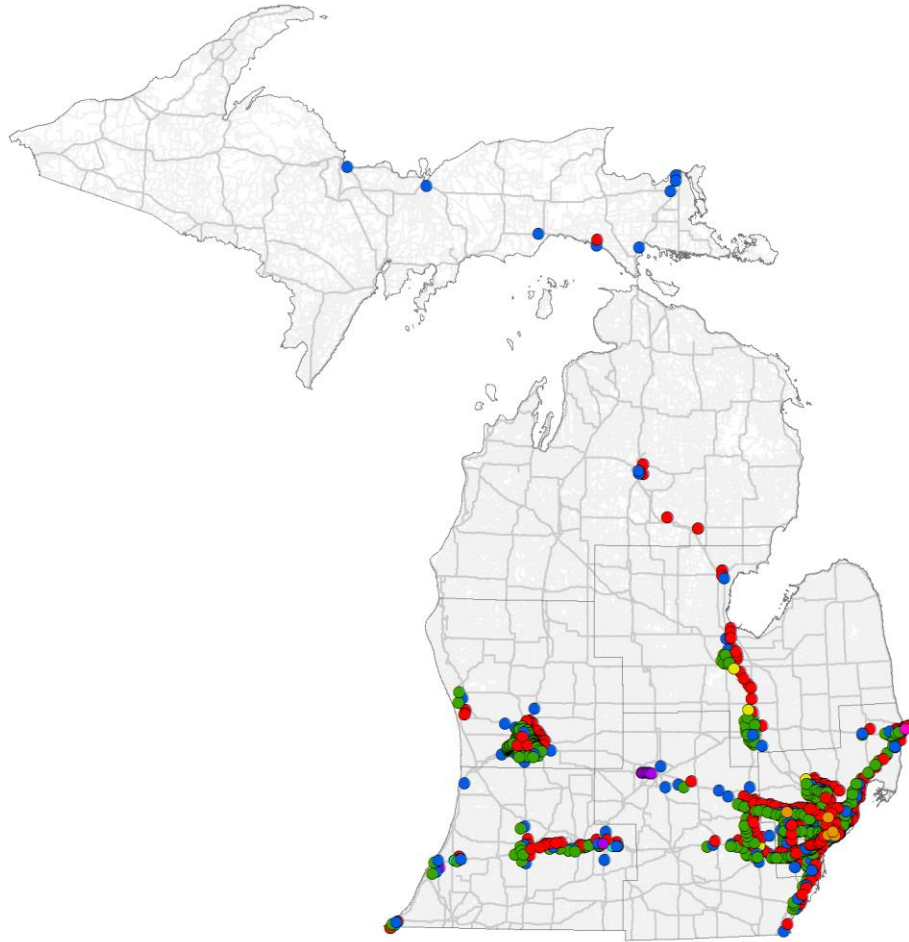
VENDOR'S SIGNATURE: _____

DATE: _____

ATTACHMENT A

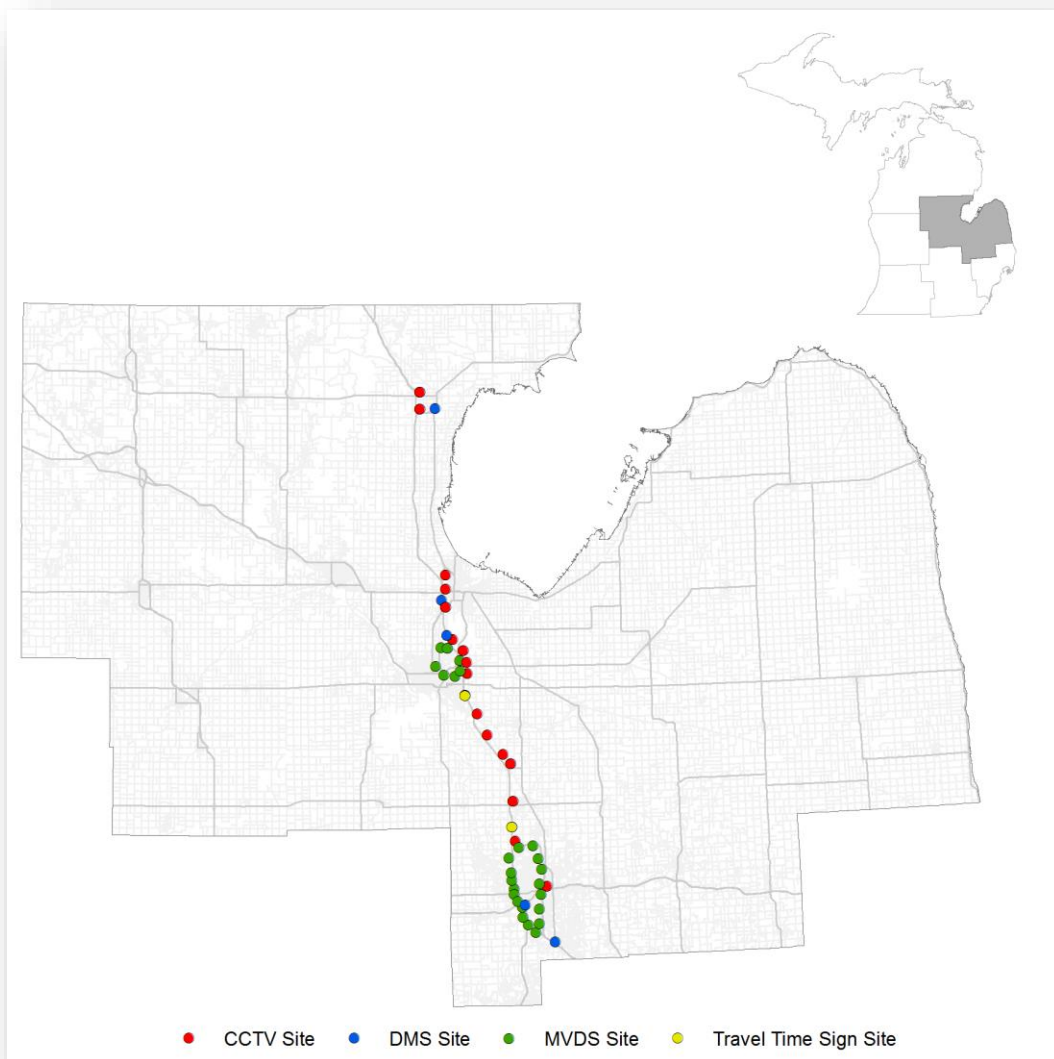
CURRENT SYSTEM DESCRIPTION

Provided in the following section are detailed descriptions of the ITS Infrastructure currently installed in the field, as well as descriptions of planned systems in the future.

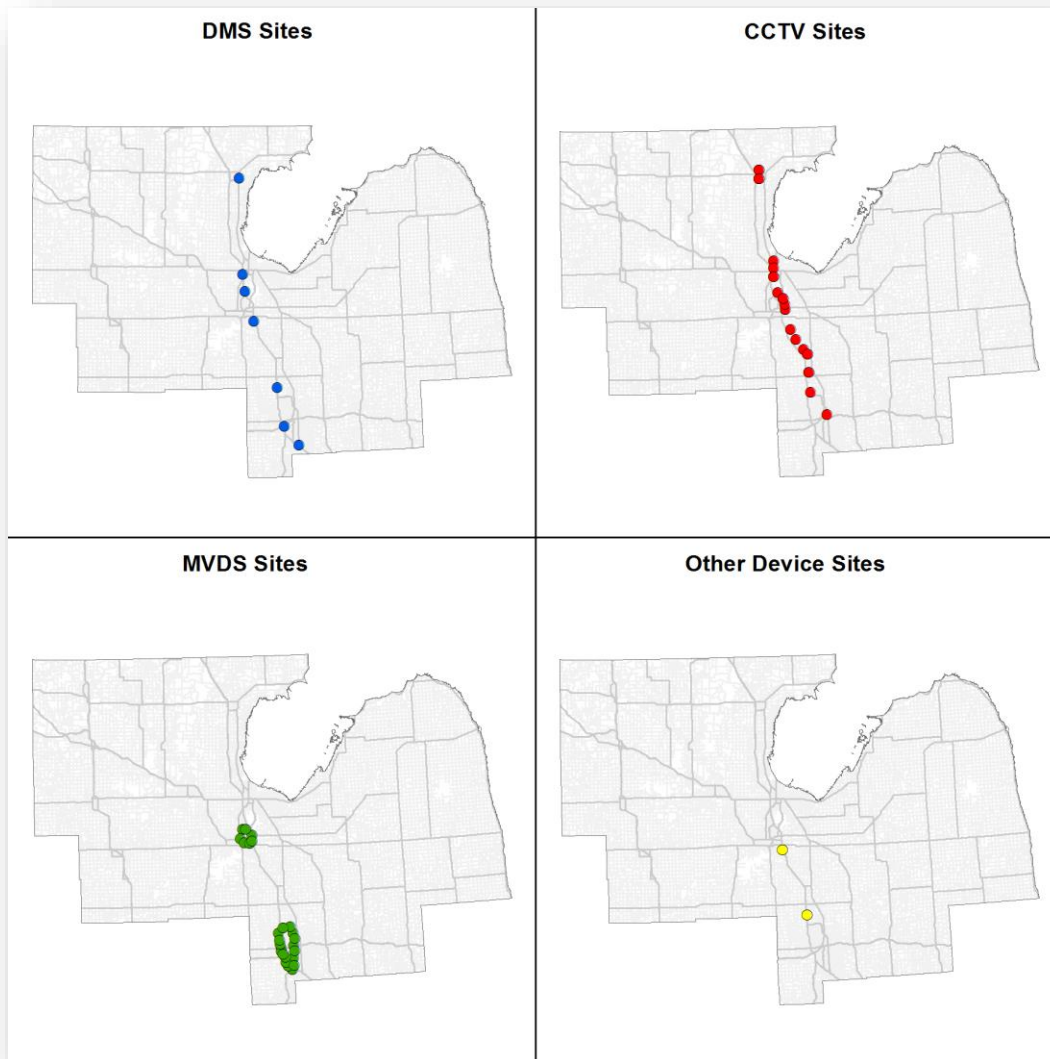


- | | | |
|----------------------------|-------------|-------------------------|
| ● Border Wait Time | ● DMS Site | ● MVDS Site |
| ● CCTV Site | ● DSRC Site | ● Travel Time Sign Site |
| ● Curve/Speed Warning Site | ● DTPS Site | ● TPIMS Site |

BAY REGION



The MDOT Bay Region currently has a number of ITS device installed in the field and are in the process of designing and expanding their ITS. A brief description of each current and future system is provided below.



Current Systems

Genesee Phase 1 (87775) - 31.60 mi of installation of 18 microwave detection system devices, 2 closed circuit television cameras, 2 dynamic message signs, and 3 communication towers on I-475, I-75/US-23, and M-15 in the cities of Burton, Flint and Swartz Creek, Genesee County. Communications to the ITS devices include a combination of cellular ISP, wired Ethernet, fiber-optics, unlicensed wireless microwave(900MHz, 4.9GHz, 5.8GHz), and licensed wireless microwave links. The current Genesee LAN consists of 3 Layer 3 switches with the available routing protocols (OSPF, OSPFv3, EIGRP, RIPv2) delivering device monitoring and control over leased line VRF to the State Traffic Operations Center. Devices are also monitored over a secondary network connection from the South Eastern Michigan Traffic Operations Center (SEMTOC) centralized Solarwinds Network Management System.

Saginaw 75/675 (100523) is deployed along freeway I-75 and I675 extending from mile marker 136.6 to past 162.2 in the Bay Region. Included in this system are 9 CCTV, 3 DMS, and 8 MVDS. Communications to the ITS devices include a combination of cable ISP,

wired Ethernet, fiber-optics, unlicensed wireless and licensed wireless microwave links. The current Saginaw LAN consists of 3 Layer 3 switches with the available routing protocols (OSPF, EIGRP) delivering device monitoring and control over leased line VRF to the State Traffic Operations Center using the Statewide Advanced Traffic Management System. Devices are also monitored over a secondary network connection from the South Eastern Michigan Traffic Operations Center (SEMTOC) centralized Solarwinds Network Management System.

Triangle Phase 1 (106682) is deployed along freeway I-75 and US-23 extending from the Metro Region to the North Region. Included in this system are 6 CCTV, 2 DMS, and 2 TTS. Communication paths to CCTV, DMS and TTS include the use of both private and public networks utilizing cellular ISP, cable ISP, wired Ethernet, fiber-optics, licensed, and unlicensed wireless microwave links.

Clare DMS (107039) is deployed along US-10 between mile markers 128.1 and 161.8. Included in this system are 2 DMS. Communications to these DMS are a combination of cellular ISP, wired Ethernet, and fiber-optics.

All ITS equipment delivered over public networks in the Bay Region resides behind network firewalls and may incorporate the combined use of several different security technologies, including but not limited to Stateful inspection with scripting, IP and Mac filtering, Address and Port translation; VPN: IPsec with IKEv1, IKEv2, NAT Traversal; SSL, SSLv2, SSLv3, FIPS 197, Open VPN client and server; PPTP, L2TP; Cryptology: SHA-1, MD5, RSA; Encryption: DES, 3DES and AES up to 256-bit.

Future Systems

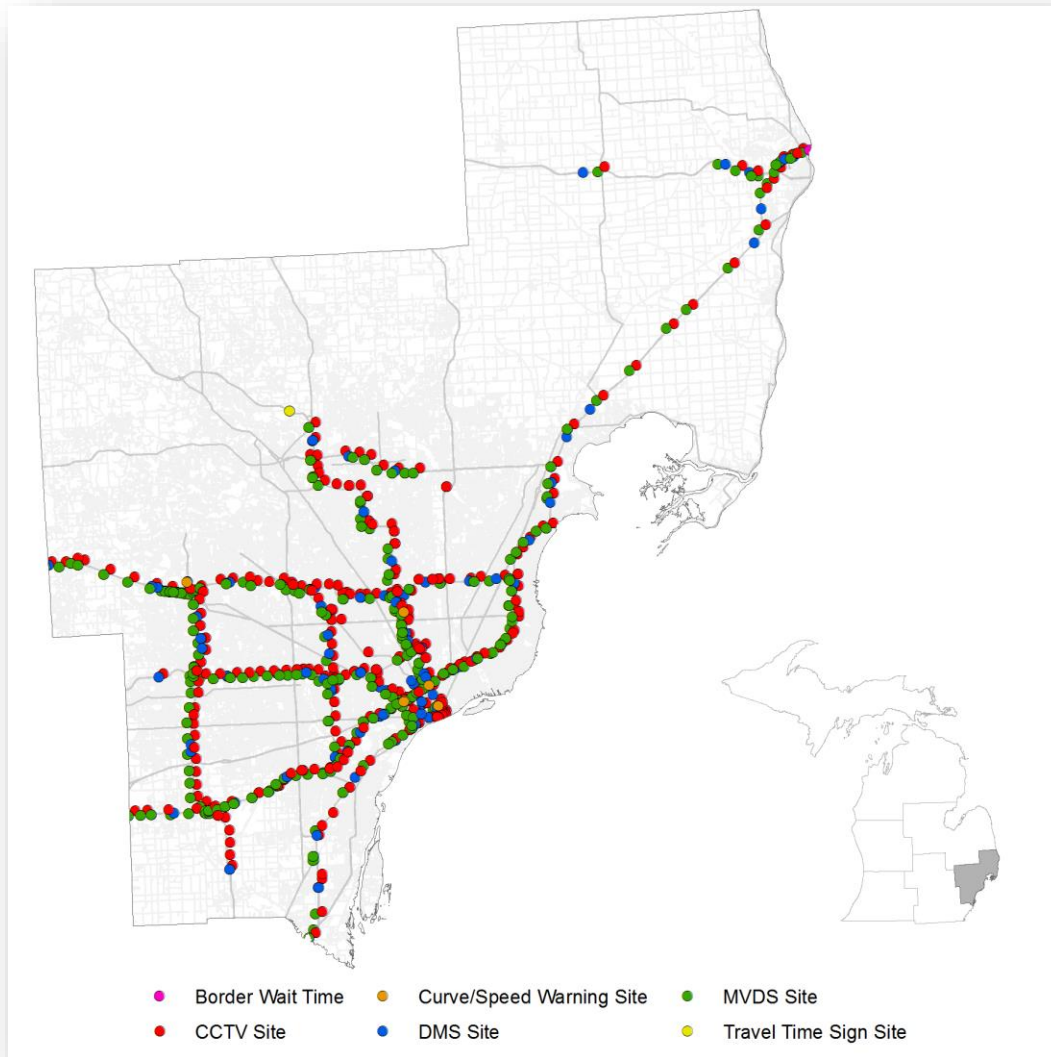
Genesee Phase 2 (JN113616) - The MDOT Bay Region has a planned ITS for construction along freeways I-75 and I-69 in the Flint Area. Included in this system will be approximately 5 CCTV, 2 DMS, and 1 communication tower. The system is focused on three freeways I-75, I-475 and I-69 and extends from approximately mile marker 108 to 118 on I-75 and 122 to 139 on I-69. Communications to CCTV and DMS will tie into the existing OSPF, OSPFv3, ERP Version 2 (ITU-T G.8032/Y.1344 to 2010) network and be a combination of leased cellular service, leased cable service, fiber-optics, wired Ethernet, licensed microwave, and unlicensed microwave wireless. All devices are planned to be integrated with the MDOT Statewide ATMS Software Package, and monitored from the South Eastern Michigan Traffic Operations Center (SEMTOC) centralized Solarwinds Network Management System.

I-69 Phase 2 (JN120434) – The MDOT Bay Region has planned two ITS installations in St. Clair County from Wales Center to Lapeer County Line. Included in this system will be approximately 11 miles of conduit and fiber optic cabling, 5 MVDS, 5 CCTV cameras, and 2 DMS. . All devices are planned to be integrated with the MDOT Statewide ATMS Software Package, and monitored from the Statewide Transportation Operations Center (STOC) centralized Solarwinds Network Management System.

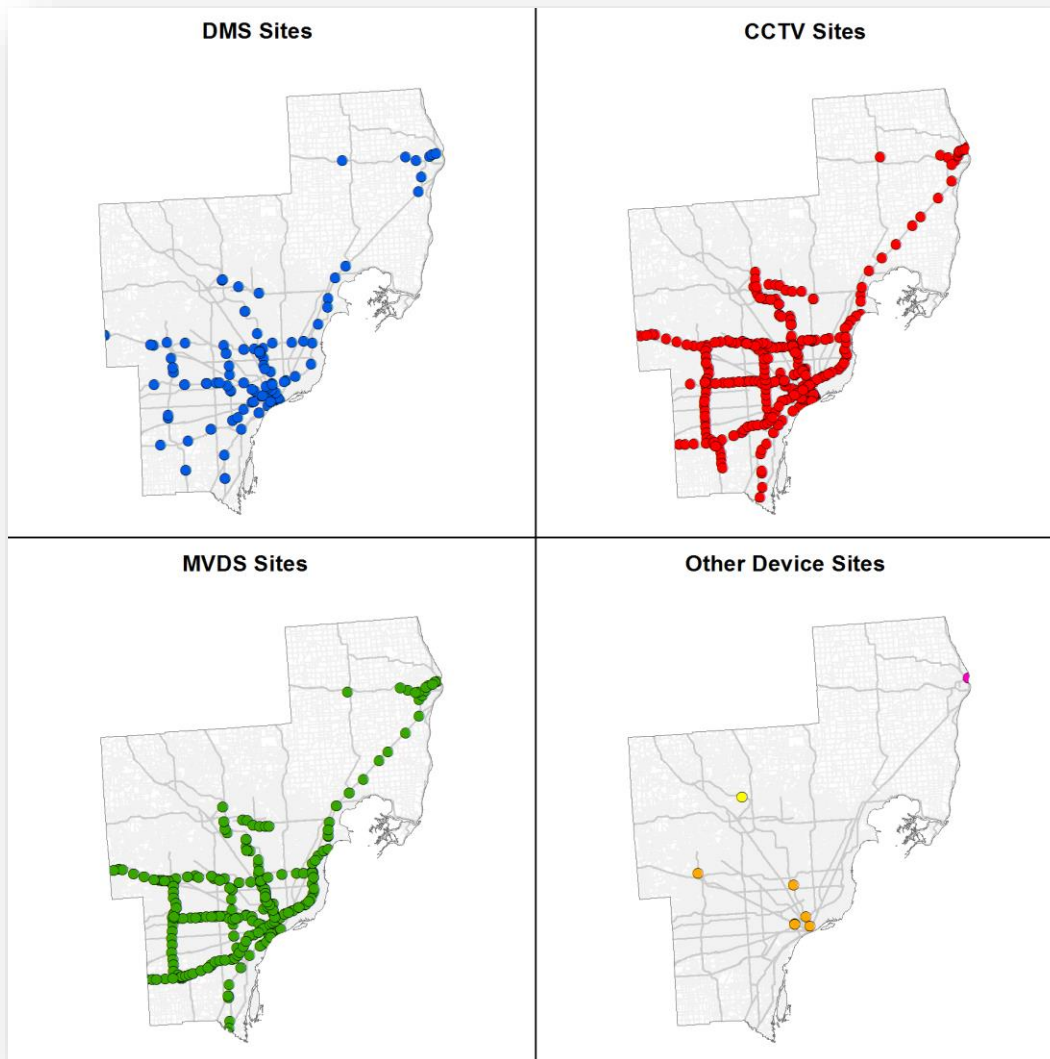
Triangle Phase 2b (JN116498) – The MDOT Bay Region has planned ITS for construction along US-127 in Isabella County. Included in this system will be approximately 3 CCTV cameras and 3 MVDS.

All devices that are installed in the future, including, but not limited to those listed above, will be included in the maintenance contract quantities upon verification of operation.

METRO REGION



The MDOT Metro Region currently has a number of ITS devices installed in the field throughout Macomb, Oakland, St. Clair, and Wayne Counties and are in the process of designing and expanding their ITS Network. A brief description of each current and future system is provided below.



Current Systems

The Michigan Department of Transportation (MDOT) operates an Advanced Traffic Management System (ATMS) on over 400 miles of Metropolitan Detroit Freeways. Major ATMS components are: Microwave Vehicle Detection Systems (MVDS), Dynamic Message Signs (DMS), Travel Time Signs (TTS), Highway Advisory Radio (HAR) systems, Closed Circuit Television (CCTV) Cameras, Speed and Curve Warning systems, Integrated Corridor Management (ICM) systems, and Border Wait Time systems. Additional devices requiring maintenance under the contract include SNMP Encoders for the Tower/Shelter Alarms, Blue Water Bridge Operations Center (BWBOC) and the Southeast Michigan Transportation Operations Center (SEMTOC), including Video Walls and rack equipment, along with the communications system described in the following paragraphs. To support the ITS Equipment, MDOT owns/leases and operates a communications network that has been deployed under multiple contracts to support approximately 300 CCTV, 100 DMS, and over 400 MVDS with these numbers increasing with existing and future integration projects. It is a Hybrid wire and wireless system

comprised of Spread Spectrum Radios (900 MHz), Microwave Wireless Ethernet (6 & 11 GHz Licensed and 5 GHz Unlicensed), Cellular, Fiber Optic, Coaxial Cable, and Twisted Pair, on a 10 Gigabit Ethernet Local Area Network (LAN). The communication backbone of system is a local network of 17 towers transmitting tower-to-tower and tower-to fiber optic utilizing Coarse Wavelength Division Multiplexers (CWDM) on an Alcatel OmniSwitch 10 Gigabit Ethernet LAN.

The field devices communicate via Ethernet to a combination of Layer 2 and Layer 3 Managed Field Ethernet Switch (MFES) in the cabinets. The cabinets communicate to the regional node using a combination of copper, fiber optic, 900 MHz, and 5 GHz Unlicensed Microwave Radios. The regional nodes relay data using 6 & 11 GHz Licensed Microwave Radios and Fiber Optic communications to communicate back to SEMTOC.

The current communication network consists of a total of 20 Nodes. Four of the nodes and SEMTOC are interconnected via Verizon Fiber Optic leased lines to the 1692 MSE CWDM. All five locations include Alcatel OS9700 Core Switches to complete a redundant fiber communications ring. In addition, eleven nodes are interconnected using microwave Point-to-Point architecture to one of the four nodes on the fiber communications ring to communicate back to SEMTOC. Current/Future ITS projects within the region will be transitioning into a Hybrid Network comprised of Partial Mesh, Star, and Ring Topologies that will have multiple paths back to SEMTOC. MDOT also has an agreement with MPSCS and has some equipment co-located on MPSCS towers that support Michigan State Police (MSP).

Wireless Communication

Since the 900 MHz spread spectrum frequency band and 5 GHz microwave wireless is unlicensed, it is possible that others may install equipment that interferes with the radio links at a future date. The unlicensed wireless links are setup as Point-to-Point (PtP) and Point-to-Multipoint (PtMP). Point-to-Point links are utilized for relay communications due to no line of site to the regional NODE. Point-to-Multipoint links are setup with base stations at the regional nodes and configured to communicate to remote subscriber units at the field device locations. The licensed wireless backhaul links consist of Point-to-Point Alcatel MDR8000 6 & 11 GHz Microwave Radios that relay communications from node-to-node that are on the fiber communications ring.

Main Towers

The towers throughout the Metro Region are monitored by SNMP encoders and have up to 28 current analog alarms. These alarms are captured by the network management system and distributed to the responsible parties. The analog alarms include door, gate, power, UPS, generator, temperature, smoke, and tower strobes. All of the tower locations include a Layer 3 Alcatel OmniSwitch for the core communications network. Alcatel OS9700's are in the nodes that are currently on the communications fiber ring and OS6850/OS6855's are in all of the remaining nodes. The OmniSwitch's include advanced routing software to support the OSPF routing protocol used for the communications network and Protocol-Independent Multicast-Sparse Mode (PIM-SM) for routing of the video. The towers consist of a variety of antenna types to support the wireless communications from the field devices. The communication cables route down the tower and into the shelters. They include, but are not limited to, Waveguide, Cat5, Coax, Fiber Optic and Multi-pair cabling.

Communication links are as follows:

- Communications Fiber Ring – Alcatel 1692 MSE (8 channel) Coarse Wavelength Division Multiplexer utilizing leased lines from Verizon to complete a redundant link between the Nodes
- Licensed Microwave Backhaul – Alcatel MDR8000 (6 GHz & 11 GHz) to link Nodes to the Fiber Ring Nodes and Nodes to Nodes that are obstructed or exceed distances to the Fiber Ring Nodes
- Unlicensed 5 Ghz Wireless – Point-to-Multi-Point (PtMP) sectorized base stations to communicate to the remote subscribers at the field device locations within the regional node and Point-to-Point (PtP) Base Radios to backhaul repeater sites.
- Spread Spectrum (900 MHz) – Master radios on the tower to communicate to the remote subscribers at field device locations within a regional node (excludes CCTV).
- Fiber Optic – Segments of the network contain fiber loops that terminate at the Nodes to Media Converters, Transceivers, and SFP's in the network switches.
- Coax & Multi-pair – Tower cameras and local devices within distance are directly cabled into the shelters.
- Cellular 3G/4G/LTE – Used for temporary access to the devices through the internet where fiber optic communications or wireless LOS is inaccessible to include IP and Mac Filtering in addition to ACL's and Network Address/Port Address Translation (NAT/PAT).

Center-to-Center Connectivity (SEMTOC to BWBOC)

There is currently 10 Gbit/s fiber connectivity between MDOT's operation centers from Detroit (SEMTOC) to Port Huron (BWBOC) with network redundancy. This is achieved by (37) Alcatel layer 3 switches along the I-94 interstate through (4) ERIPv2 communication rings that provide backbone redundancy through the field switches in the event that there is a break in the backbone fiber connectivity. This allows the sharing of assets at both operation centers.

Integrated Corridor Management (ICM)

State and local agencies are in coordination of physical transportation assets for corridor mobility to maximize underutilized capacity and to reduce congestion by providing detours during an incident on the freeways. This includes cameras on the arterials in addition to static and dynamic trailblazing signs installed on local agency roads to be used for integrated corridor mgmt.

Border Wait Time Systems

Vehicle detection and Bluetooth readers are installed at the international border crossing to be used in the wait time system at the Blue Water Bridge. These devices are delivered via Wireless to a central location and securely delivered to the Statewide ATMS for real-time information for wait times at the border crossing.

Solarwinds Statewide Network Management System (NMS)

The Servers for the Statewide NMS reside in the Metro Region at SEMTOC. Connections to the additional regions throughout the state are managed through the ITS Firewall. This system includes a web server that makes the NMS information available to assigned users throughout the state and real-time information from any ITS device on the ITS Networks.

All ITS equipment delivered over public networks in the Metro Region resides behind network firewalls and may incorporate the combined use of several different security technologies, including but not limited to Stateful inspection with scripting, IP and Mac filtering, Address and Port translation; VPN: IPSec with IKEv1, IKEv2, NAT Traversal; SSL, SSLv2, SSLv3, FIPS 197, Open VPN client and server; PPTP, L2TP; Cryptology: SHA-1, MD5, RSA; Encryption: DES, 3DES and AES up to 256-bit.

Future Systems

(JN 111643) – This project will be adding 13 CCTV cameras, 5 DMS's, and 26 MVDS's to the system.

(JN 110937) – This project will be adding 4 CCTV cameras and 1 DMS to the system.

(JN 114864) – This project will be adding 2 CCTV cameras to the system.

(JN 120436) – This project will be adding 2 CCTV cameras to the system.

(JN120437/JN120436) – This project will be adding 4 CCTV cameras and 1 DMS to the system.

(JN 120423) – This project will be adding 1 DMS to the system.

(JN 120422) – This project will be adding 1 DMS to the system.

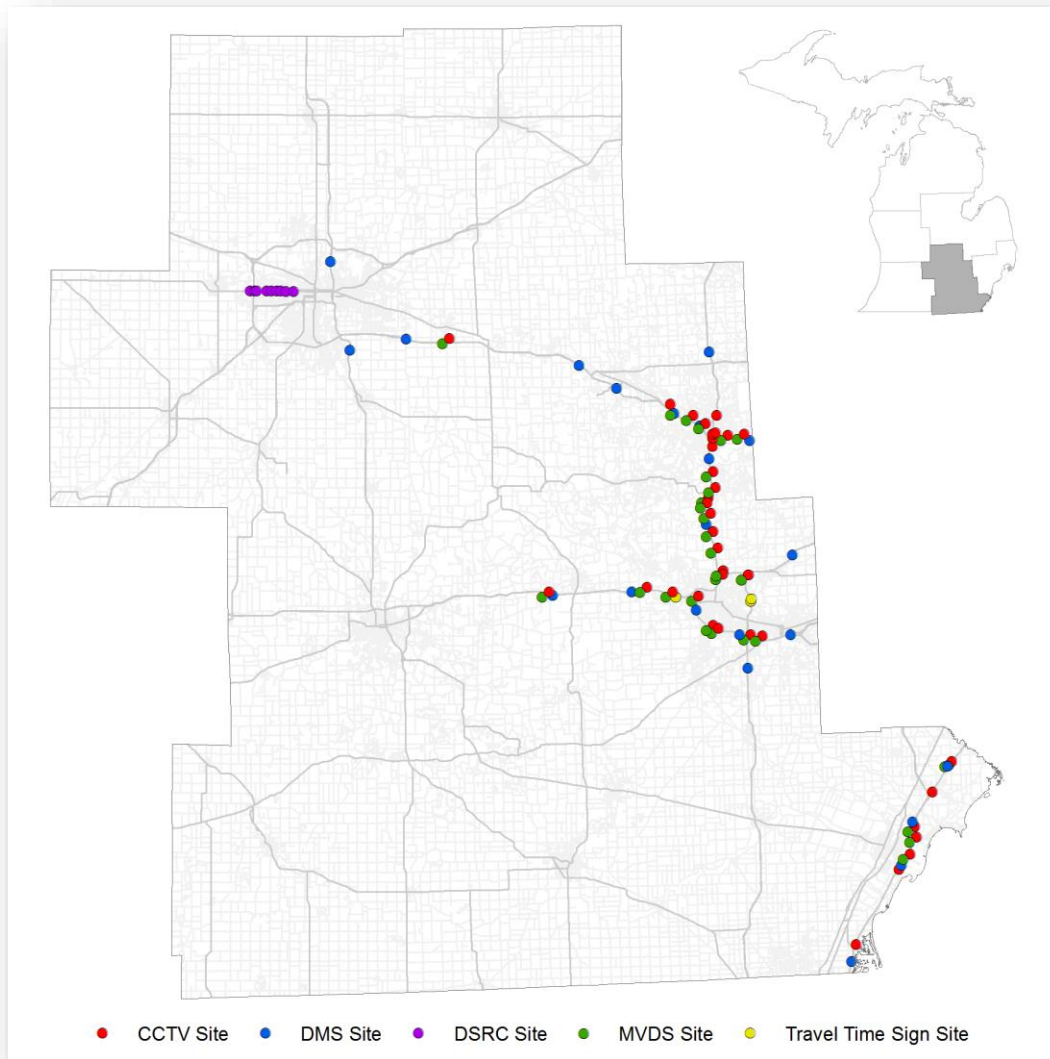
(JN 120424) – This project will be adding 2 DMS to the system.

(JN 110936) – This project will be adding 6 CCTV cameras and 3 DMS to the system.

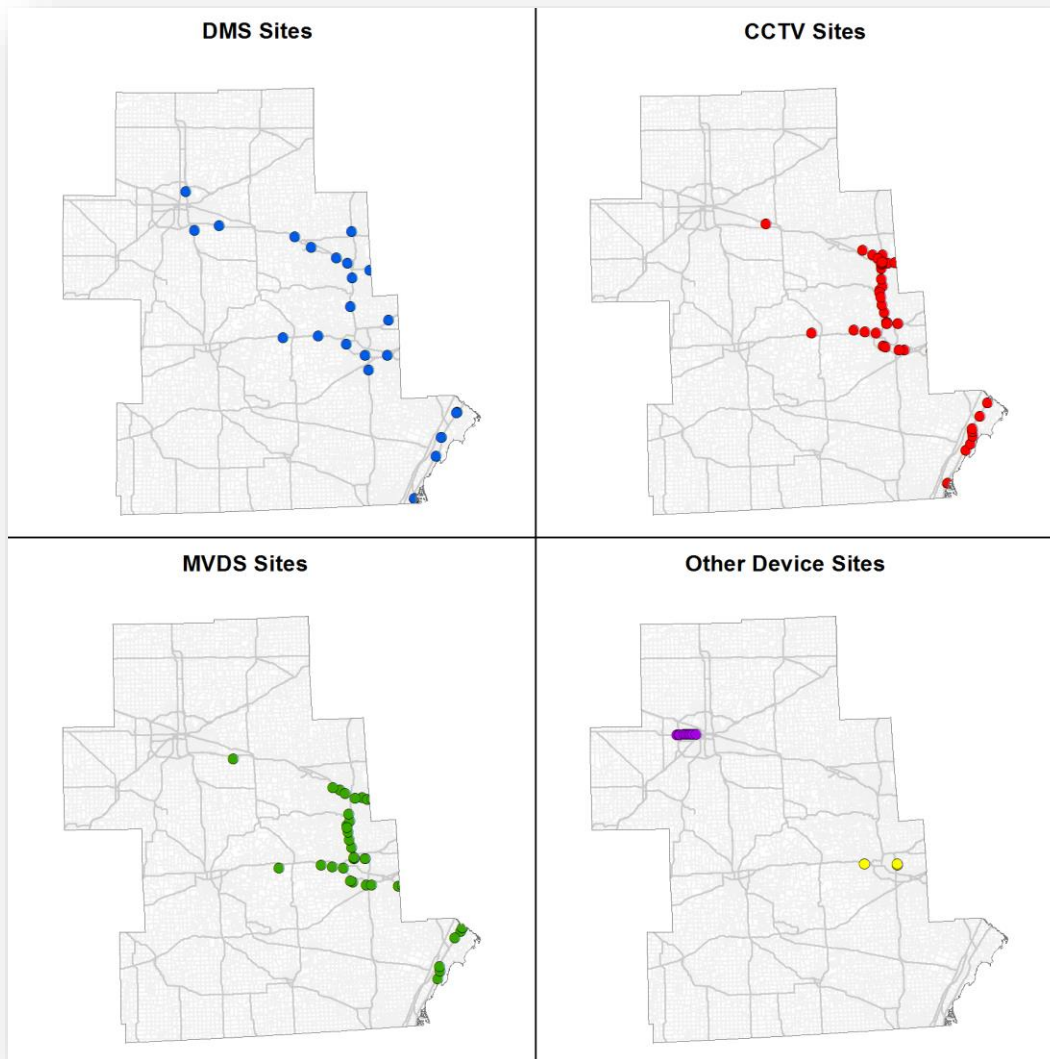
(TPIMS TIGER GRANT) – This project will be adding 8 TPIMS sites and 8 DTPS sites. Depending on the final design of the system, some of the TPIMS and DTPS sites may be installed in Bay and/or University Regions.

All devices that are installed in the future, including, but not limited to those listed above, will be included in the maintenance contract quantities upon verification of operation.

UNIVERSITY REGION



The MDOT University Region currently has a number of ITS device installed in the field, and are in the process of designing and expanding their ITS. A brief description of each currently operational and future system is provided below.



Current Systems

(JN 88138) - 36.00 mi of an intelligent transportation system on I-96 from Fowlerville easterly to the Oakland/Livingston county line and on US-23 from Crouse Road southerly to Silver Lake Road in the cities of Howell and Brighton, Livingston County. Included in this system are 10 CCTV, 7 DMS, 5 MVDS, and communications infrastructure. The communications infrastructure is comprised of cable ISP, cellular ISP, wired Ethernet, and fiber optic, delivering monitoring and control to the State Traffic Operation Center, Statewide Advanced Traffic Management System, and the University Region TSC. Devices are also monitored from the South Eastern Michigan Traffic Operations Center (SEMTOC) centralized Solarwinds Network Management System.

(JN 107179) - Various locations on I-94 from Kalmbach Road to the east I-94/US-12 interchange, US-23 from Bemis Road to 6 Mile Road, and M-14 at Joy Road. Included in this system are 14 CCTV, 8 DMS, 5 TTS, 13 MVDS, and communications infrastructure. The communications infrastructure is comprised of cable ISP, cellular ISP, wired

Ethernet, fiber optic, and unlicensed microwave wireless links, delivering monitoring and control to the State Traffic Operation Center, Statewide Advanced Traffic Management System, and the University Region TSC. Devices are also monitored from the South Eastern Michigan Traffic Operations Center (SEMTOC) centralized Solarwinds Network Management System.

(JN 110762)- At ten locations along trunk line routes I-96, US-127, and I-496. Intelligent Transportation System includes 3 dynamic message signs, 6 closed circuit television cameras, 1 tower, 6 microwave vehicle detection systems, 7 pavement condition sensors, and 4 visibility sensors. The communications infrastructure is comprised of cable ISP, cellular ISP, wired Ethernet, fiber optic, unlicensed microwave , and licensed microwave wireless links, delivering monitoring and control to the State Traffic Operation Center, Statewide Advanced Traffic Management System, and the University Region TSC. Equipment not delivered over public networks route through existing network infrastructure at the Mason Building in Ingham County. Devices are also monitored from the South Eastern Michigan Traffic Operations Center (SEMTOC) centralized Solarwinds Network Management System.

(JN 106649) - Various locations along I-75 from the Michigan/Ohio state line northerly to Dixie Highway, Monroe and Wayne Counties. Included in this system are 12 closed circuit television, 6 dynamic message signs, 7 microwave vehicle detection systems, and 1 tower. The communications infrastructure is comprised of cellular ISP, wired Ethernet, fiber optic, unlicensed microwave , and licensed microwave wireless links, delivering monitoring and control to both the State Traffic Operation Center, and South Eastern Michigan Traffic Operations Center utilizing the Statewide Advanced Traffic Management System. Equipment not delivered over public networks route through existing network infrastructure of the MDOT Metro Region and are incorporated into the current layer 3 OSPF, and ERP network design. Devices are also monitored from the South Eastern Michigan Traffic Operations Center (SEMTOC) centralized Solarwinds Network Management System.

(JN 106928A) - This project is currently in burn in and will be entering the maintenance contract at the end of this year 2015. This project is in both University and Bay Regions. The devices for the University Region are: 2 DMSs, 6 CCTVs, and 8 MVDSs. The devices for Bay region are: 3 CCTVs and 3 MVDSs.

(JN 110762A) - The original project has been completed for some time now, however there are still 4 CCTVs and 3 MVDSs remaining to be constructed. It is anticipated that the 3 additional CCTVs and 1 CCTV at the SBA site will be completed by Jan 30, 2016, entering the Maintenance contract. The original contract consisted of: 11 CCTVs (2 are type B poles), 12 CCTVs, 7 DMSs, and 3 TTSSs. The additional devices yet to be completed are: 3 CCTVs, and 3 MVDSs, and one CCTV located on the SBA tower at 6 Mile and US-23.

(JN 123991A) - This project consist of 7 CCTVs and 7 MVDSs located along US23 from the Northfield Church Rest Area northerly to M-36.

All ITS equipment delivered over public networks in the University Region resides behind network firewalls and may incorporate the combined use of several different security technologies, including but not limited to Stateful inspection with scripting, IP and Mac filtering, Address and Port translation; VPN: IPSec with IKEv1, IKEv2, NAT Traversal; SSL, SSLv2, SSLv3, FIPS 197, Open VPN client and server; PPTP, L2TP; Cryptology: SHA-1, MD5, RSA; Encryption: DES, 3DES and AES up to 256-bit.

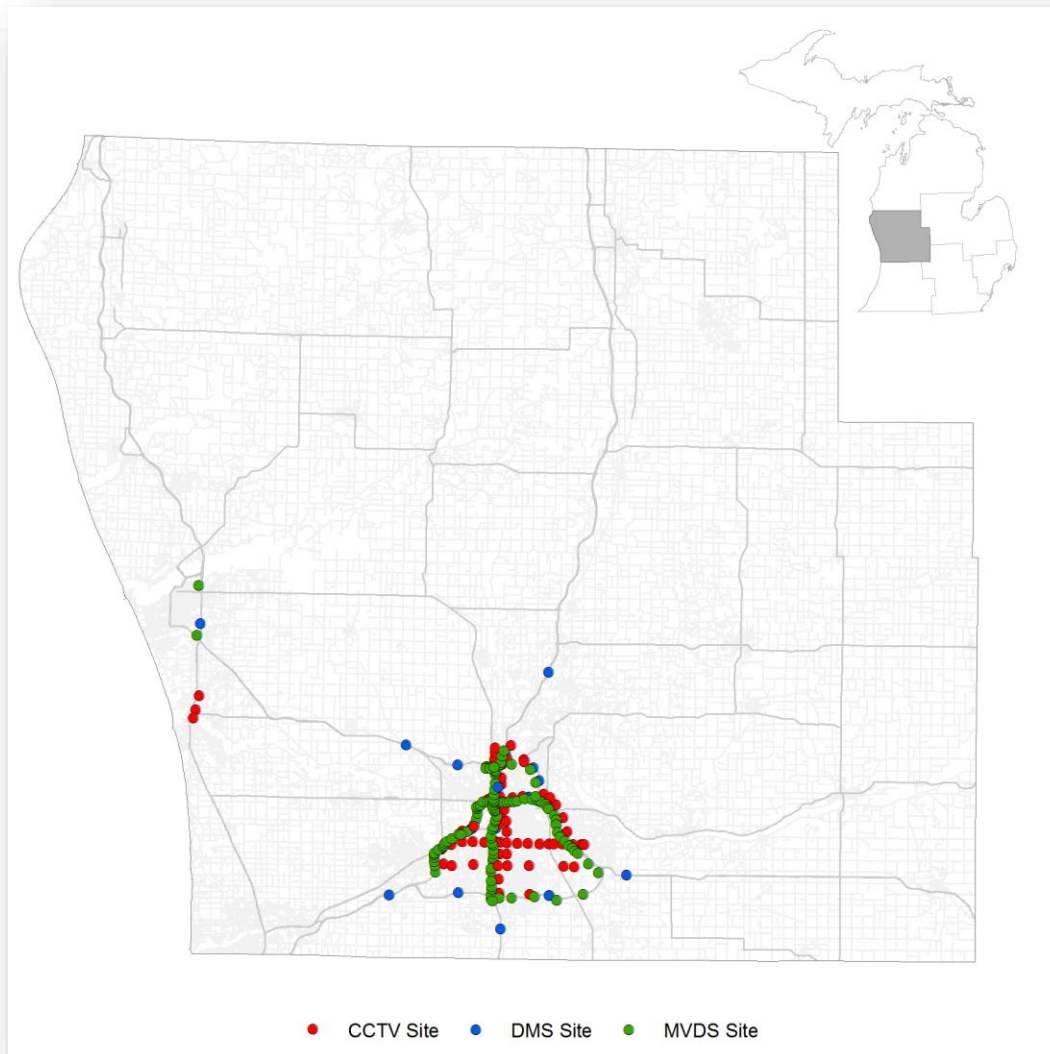
Future Systems

(JN 110616A) - I75 from Ohio State line northerly to Dix Highway in Wayne County. This project includes both Monroe and Wayne Counties. The communications between I275 and N. Dixie Hwy in Monroe County will be updated to Fiber and connect at the I275 CCTV in Monroe County. Also the Sandy Creek CCTV will be relocated as part of JN 110616A in 2016, requiring another burn in.

(JN 111643A) - 6 CCTVs, 6 MVDSs, and 1 DMS. This project is supposed to start burn in in Feb 2016, so it will enter the maintenance contract in the spring of 2016. There are several other devices for Metro Region, they are: 8 CCTVs, 18 MVDSs, 4 DMSs. Some of these devices are being installed on existing infrastructure.

All devices that are installed in the future, including, but not limited to those listed above, will be included in the maintenance contract quantities upon verification of operation.

GRAND REGION



The MDOT Grand Region currently has a number of ITS device installed in the field, and are in the process of designing and expanding their ITS. A brief description of each current and future system is provided below.

Current Systems

All ITS Infrastructure located in Kent County including the West Michigan TOC (WMTOC) is currently and will remain maintained under a municipal contract with the City of Grand Rapids maintenance forces. All devices on M-6 in Ottawa County are also maintained by the City of Grand Rapids. The section below is described for informational purposes and is provided for reference and better understanding of the overall Grand Region ITS system and its linkage to devices outside of the Kent County boundaries.

Currently in the Grand Region, MDOT does not utilize a consolidated central traffic management system known as an Advanced Traffic Management System (ATMS). Instead

vendor-specific applications are utilized to manage each device type. MDOT uses the vendor specific central control systems to transport video and device data to and from field devices on the telecommunications network. Due to the established center-to-center connectivity data/video is also shared bi-directionally with the City of Grand Rapids and Grand Rapids Police department. The primary ITS device types currently within the system are CCTV cameras, vehicle detection, and DMSs, with the traffic signals on an isolated network. Video cameras are being used to transfer live images to the WMTOC, which outputs device control data (pan, tilt, and zoom) to the cameras. Video is viewed at the WMTOC as well as shared with other agencies and public websites such as MDOT's MI Drive. The system includes legacy and newer DMS installations, which communicate with controllers (vendor specific or 2070) that transmit message data to and from the WMTOC central control systems. It is anticipated that both Parsons's ATMS and Solarwinds monitoring software will be installed on the system in 2012.

In addition, MDOT currently has six closed loop systems in the Grand Region outside of the Grand Rapids Metro area. Communication to the master controllers is done via fiber optic, wireless radio interconnect or dial-up POTS and occurs only on an as-needed basis for signal timing maintenance or manual timing plan changes, such as for special events. The closed loop traffic signal systems currently in place in the Grand Region are operated and maintained by either MDOT's traffic signals unit or the City of Grand Rapids. All signals outside of the Grand Rapids metro area are maintained by MDOT or the local agency such as the City of Muskegon or the City of Grand Rapids. The approximately 350 signals in the Grand Rapids metro area are maintained by the City of Grand Rapids. Currently, while these signals are not operated by MDOT, many are accessible by the WMTOC via the center-to-center connectivity.

The number of existing ITS and traffic control devices managed by the WMTOC in Kent/near Ottawa County are presented below.

- 64 CCTV Cameras
- 25 DMS
- 4 Variable Speed Signs (VSS) and an Anti-icing System
- 132 MVDS units.

Currently, the Grand Region devices outside of the Kent County area, to be maintained under the contract, include:

- 3 CCTV Cameras (in Grand Haven)
- 2 DMS (in Muskegon and Allegan Counties)

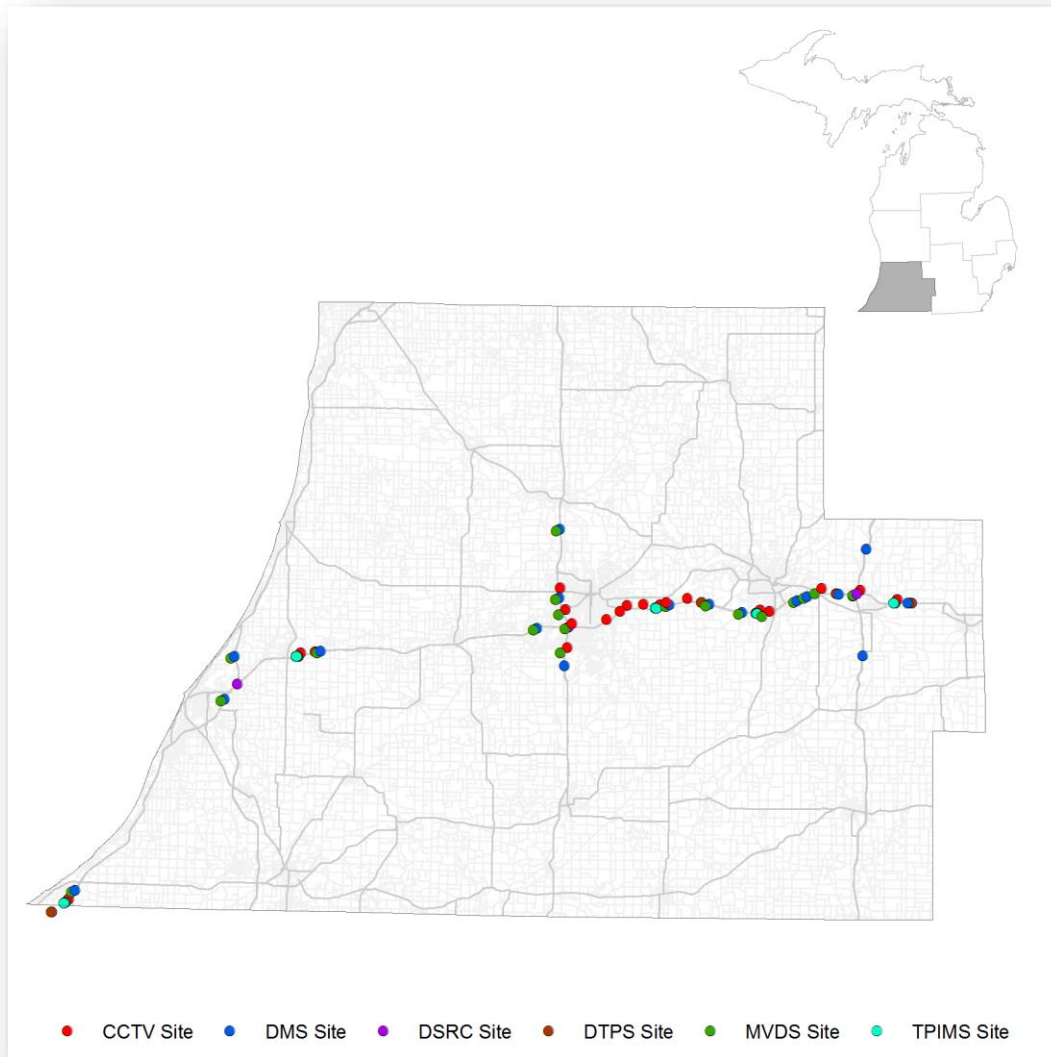
These devices above are included in the maintenance contract quantities.

To support the ITS equipment, MDOT owns/leases and operates a communication network that has been deployed under multiple contracts. It is a hybrid wire-line and wireless system of spread spectrum radio, wireless Ethernet, licensed microwave, unlicensed microwave, WiMAX, fiber-optic, SONET, 10BaseT local area network (LAN), coaxial cable, and twisted pair cable. Devices are also viewed and controlled from State Traffic Operations Center (STOC). In addition all ITS devices are monitored from the South Eastern Michigan Traffic Operations Center (SEMTOC) centralized Solarwinds Network Management System.

All ITS equipment delivered over public networks in the Bay Region resides behind network firewalls and may incorporate the combined use of several different security technologies, including but not limited to Stateful inspection with scripting, IP and Mac filtering, Address and Port translation; VPN: IPSec with IKEv1, IKEv2, NAT Traversal; SSL, SSLv2, SSLv3, FIPS 197, Open VPN client and server; PPTP, L2TP; Cryptology: SHA-1, MD5, RSA; Encryption: DES, 3DES and AES up to 256-bit.

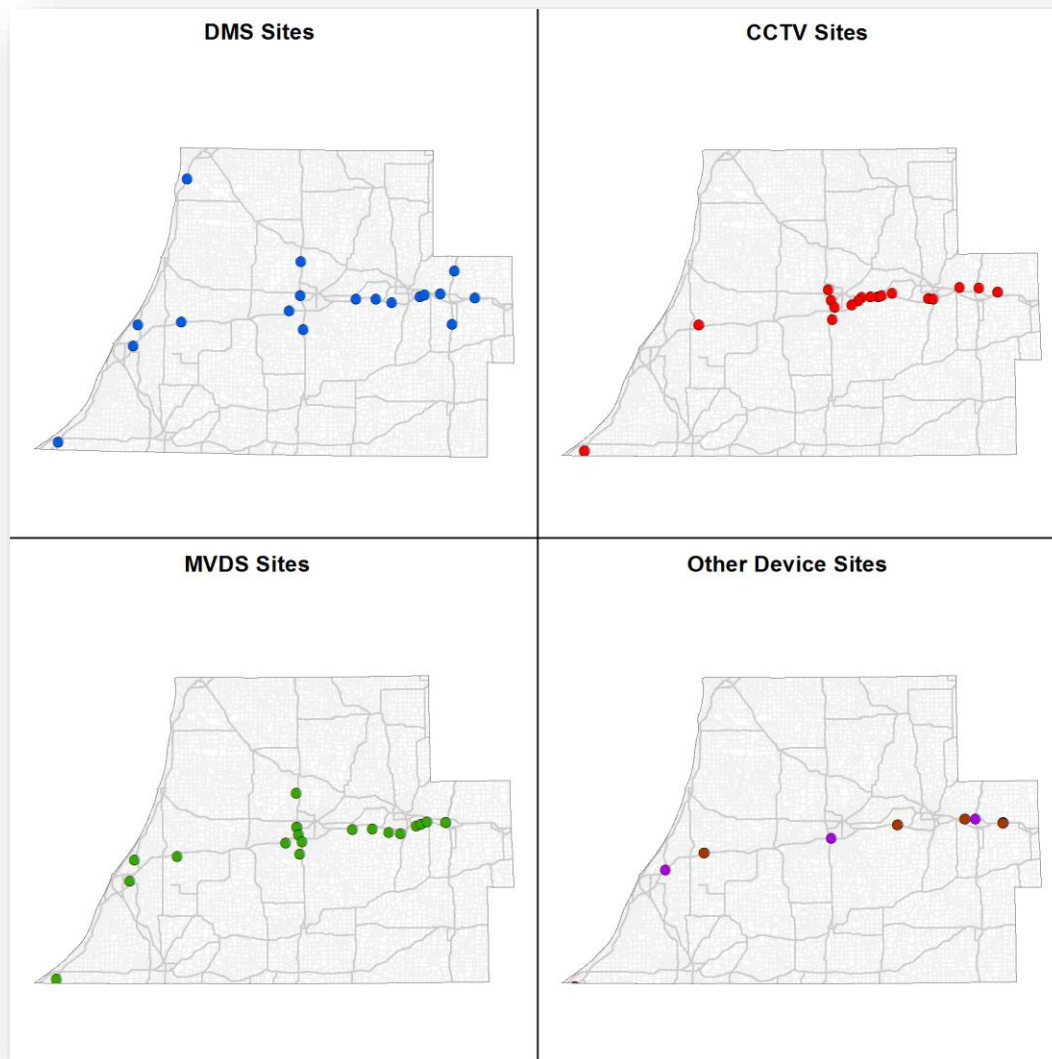
All devices that are installed in the future, including, but not limited to those listed above, will be included in the maintenance contract quantities upon verification of operation.

SOUTHWEST REGION



The MDOT Southwest Region currently has a number of ITS device installed in the field,

and are in the process of designing and expanding their ITS. A brief description of each current and future system is provided below.



Current Systems

(JN102169) - 52.90 miles of ITS vehicle detectors, dynamic message signs, CCTV cameras, and communications network installation on I-94 from US-31 to Old US-27 and I-69 in the cities of Kalamazoo, Portage, and Battle Creek, Kalamazoo and Calhoun Counties. ITS devices include 2 CCTV, 9 DMS, and 11 MVDS. Communications to the ITS devices include a combination of cellular ISP, cable ISP, wired Ethernet, and fiber-optics, delivering monitoring and control to the State Traffic Operation Center, Statewide Advanced Traffic Management System, and the Southwest Region TSC. Devices are also

monitored from the South Eastern Michigan Traffic Operations Center (SEMTOC) centralized Solarwinds Network Management System.

(JN107963) - 47.70 miles of ITS dynamic message signs, CCTV cameras, and communications network installation on I-94 from 9th Street to M-311 (11 Mile Road) and on US-131 from Center Drive to US-131BR in the cities of Portage, Kalamazoo, and Battle Creek, Kalamazoo and Calhoun Counties. ITS devices include 2 CCTV, 9 DMS, and 11 MVDS. Communications to the ITS devices include a combination of cellular ISP, cable ISP, wired Ethernet, fiber-optics, and unlicensed microwave wireless links, delivering monitoring and control to the State Traffic Operation Center, Statewide Advanced Traffic Management System, and the Southwest Region TSC. Devices are also monitored from the South Eastern Michigan Traffic Operations Center (SEMTOC) centralized Solarwinds Network Management System.

Coloma DMS (JN 109707) – 4 locations along I-94 and I-196 within Berrien and Van Buren Counties. ITS devices include 4 DMS, and 4 MVDS. Communications to the ITS devices include a combination of cellular ISP, wired Ethernet, and fiber-optics, delivering monitoring and control to the State Traffic Operation Center, Statewide Advanced Traffic Management System, and the Southwest Region TSC. Devices are also monitored from the South Eastern Michigan Traffic Operations Center (SEMTOC) centralized Solarwinds Network Management System.

TPIMS (JN 113689) - 115.0 miles of truck parking information and management system, 5 dynamic truck parking signs, 5 dedicated short range communications road side units (DSRC RSU), 32 magneto resistive wireless vehicle detection system, 5 Closed-Circuit Television, and truck parking Information and management systems (TPIMS) for truck parking information and management on freeways, and one DTPS location will be installed in La Porte County, Indiana. Communications to the ITS devices include a combination of cellular ISP, wired Ethernet, fiber-optics, and unlicensed wireless microwave links, delivering monitoring and control to the State Traffic Operation Center, Statewide Advanced Traffic Management System, and the Southwest Region TSC. Devices are also monitored from the South Eastern Michigan Traffic Operations Center (SEMTOC) centralized Solarwinds Network Management System.

All ITS equipment delivered over public networks in the Bay Region resides behind network firewalls and may incorporate the combined use of several different security technologies, including but not limited to Stateful inspection with scripting, IP and Mac filtering, Address and Port translation; VPN: IPSec with IKEv1, IKEv2, NAT Traversal; SSL, SSLv2, SSLv3, FIPS 197, Open VPN client and server; PPTP, L2TP; Cryptology: SHA-1, MD5, RSA; Encryption: DES, 3DES and AES up to 256-bit.

Future Systems

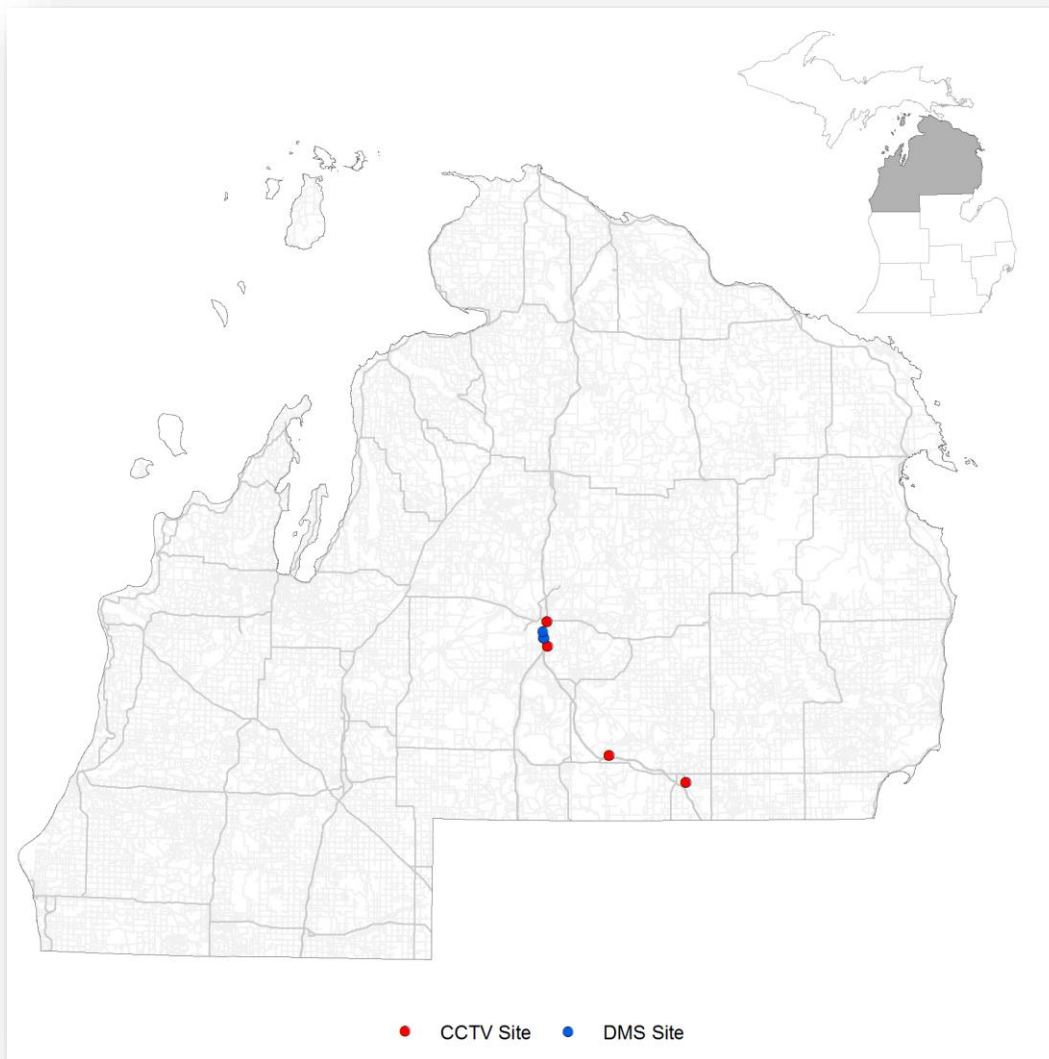
(JN 107965) - 96.20 miles of ITS infrastructure and device installation including 18 CCTV cameras collocated with 13 microwave vehicle detectors, 16 layer 2 switches, and 2 layer 3 switches on I-94 from US-12 easterly to Beadle Lake Road (M-294) in the cities of Portage, Kalamazoo, and Battle Creek, villages of Sawyer, Stevensville and Mattawan, Berrien, VanBuren, Kalamazoo, and Calhoun Counties. Communications to the ITS

devices may include a combination of cable ISP, cellular ISP, wired Ethernet, fiber-optics, and unlicensed wireless microwave links, delivering monitoring and control to the State Traffic Operation Center, Statewide Advanced Traffic Management System, and the Southwest Region TSC. Devices will also be monitored from the South Eastern Michigan Traffic Operations Center (SEMTOC) centralized Solarwinds Network Management System.

(JN 107969) – The Southwest Region is currently designing and ITS project that consists of 5 DMS scattered across southwest Michigan and is intended to provide messaging for segments of freeway that are currently not served. Sites are proposed on NB I-69 in Coldwater, I-94 WB near US-131, NB US-131 before D Ave in Kalamazoo County, SB US-131 approaching M-6 in Grand Rapids, and SB I-196 south of Holland. Communications are expected to be via cellular modem with the exception of the one in Grand Rapids which will be on Grand Region's fiber network.

All devices that are installed in the future, including, but not limited to those listed above, will be included in the maintenance contract quantities upon verification of operation.

NORTH REGION



The MDOT North Region currently has a number of ITS device installed in the field, and are in the process of designing and expanding their ITS. A brief description of each current and future system is provided below.

Current Systems

The MDOT North Region has 3 LED DMS approximately two miles south of Grayling on I-75 (one northbound, one southbound, and one located inside the Grayling Rest Area).

Triangle Phase 1 (JN 106682) - The MDOT North Region has ITS equipment along freeway I-75 in Crawford, Ogemaw and Roscommon Counties. Included in this system are 4 CCTV Cameras.

I-75 Grayling to Mackinaw City (JN 107598) - The MDOT North Region is currently

adding ITS equipment along freeway I-75 in Crawford, Otsego, Cheboygan, and Emmet Counties. It is estimated that 3 DMS, 2 CCTV Cameras, 2 Bridge Warning Systems (including bridge deck and pavement sensors, flashing beacons, ect.) and up to 8 MVDS will be installed during this construction. Most communications to these devices will be cellular with the possibility of cable communications at some locations. All devices are planned to be integrated with the MDOT Statewide ATMS Software Package.

All devices are controlled with the MDOT Statewide ATMS software, and utilize a hybrid wire and wireless system comprised of unlicensed wireless microwave, cellular, fiber-optics, 10/100/1000BaseT LAN, coaxial cable, and twisted pair cable for delivery. Devices are viewed and controlled from State Traffic Operations Center (STOC) as well as shared with other agencies and public websites such as MDOT's MI Drive. In addition all ITS devices are monitored from the South Eastern Michigan Traffic Operations Center (SEMTOC) centralized Solarwinds Network Management System.

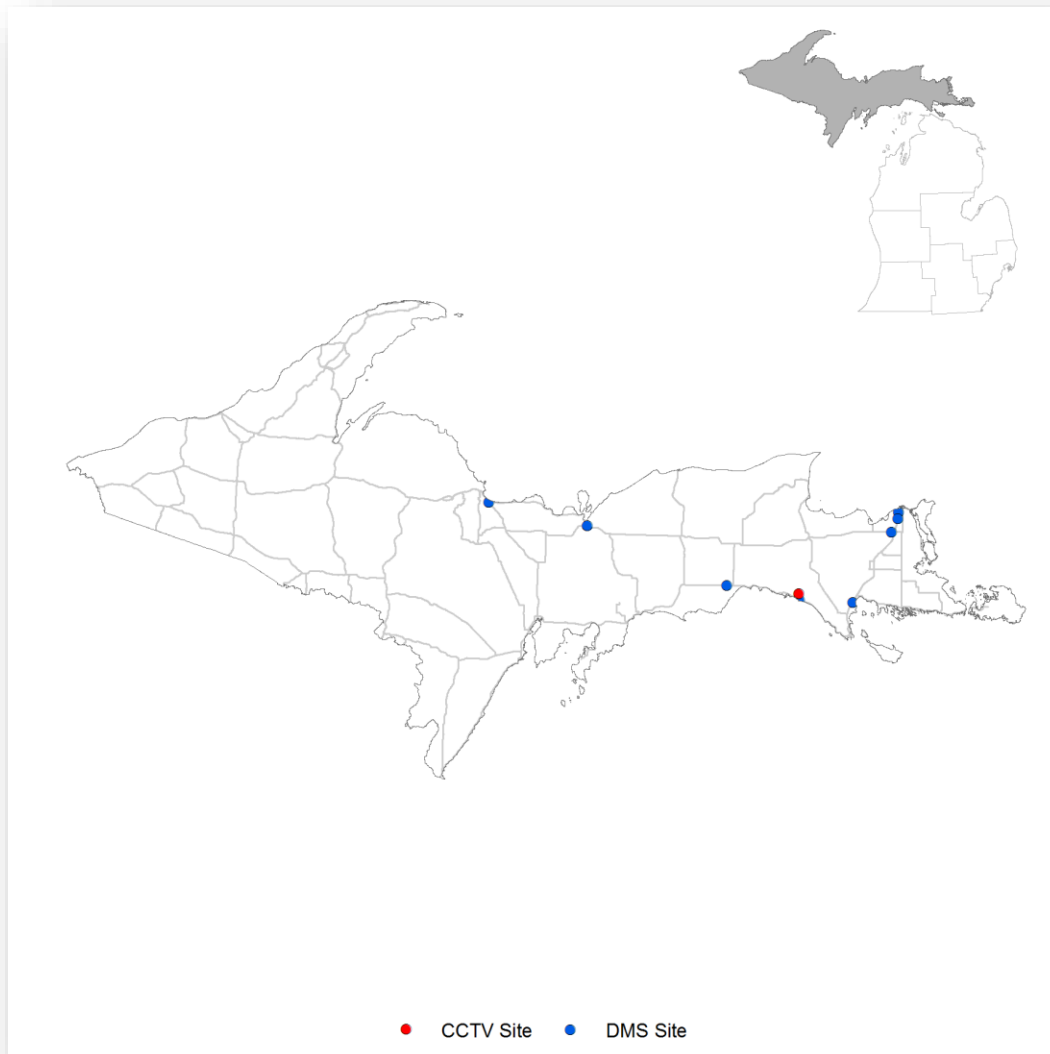
The Mackinac Bridge Authority (MBA) also monitors and operates 3 LED DMS located near the Mackinac Bridge Toll Plaza in the North Region under this contract. The MBA does not currently utilize the current MDOT ATMS Software Package to control the signs, but instead use Vanguard Control Software Package utilizing the National Transportation Communication for ITS Protocol (NTCIP).

All ITS equipment resides behind network firewalls and may incorporate the combined use of several different security technologies, including but not limited to Stateful inspection with scripting, IP and Mac filtering, Address and Port translation; VPN: IPSec with IKEv1, IKEv2, NAT Traversal; SSL, SSLv2, SSLv3, FIPS 197, Open VPN client and server; PPTP, L2TP; Cryptology: SHA-1, MD5, RSA; Encryption: DES, 3DES and AES up to 256-bit (CBC mode for IPsec).

Future Systems

All devices that are installed in the future, including, but not limited to those listed above, will be included in the maintenance contract quantities upon verification of operation.

SUPERIOR REGION



The MDOT Superior Region currently has a number of ITS device installed in the field, and are in the process of designing and expanding their ITS. A brief description of each current and future system is provided below.

Current Systems

The MDOT Superior Region has 11 LED DMS, at the following locations:
2 on US-2 between mile markers 3.0 and 12.0; 1 on M-28/M-94 at mile marker 2.4; 1 on US-41 at mile marker 0; 1 on M-28 approximately 1 mile west of I-75; 3 on I-75 between mile markers 362 and 393.

All devices are controlled with the MDOT Statewide ATMS software, and utilize a hybrid wire and wireless system comprised of cellular, fiber-optics, and wired Ethernet for delivery. MDOT has also utilized the cellular communications at some of the DMS

locations in the Superior region to support the delivery of co-located Environmental Sensor Station equipment.

Devices are viewed and controlled from State Traffic Operations Center (STOC) as well as shared with other agencies and public websites such as MDOT's MI Drive. In addition all ITS devices are monitored from the South Eastern Michigan Traffic Operations Center (SEMTOC) centralized Solarwinds Network Management System.

The Mackinac Bridge Authority (MBA) monitors and operates 3 LED DMS located near the Mackinac Bridge Toll Plaza in the Superior Region under this contract. The MBA does not currently utilize the current MDOT ATMS Software Package to control the signs, but instead use Vanguard Control Software Package utilizing the National Transportation Communication for ITS Protocol (NTCIP).

All ITS equipment resides behind network firewalls and may incorporate the combined use of several different security technologies, including but not limited to Stateful inspection with scripting, IP and Mac filtering, Address and Port translation; VPN: IPSec with IKEv1, IKEv2, NAT Traversal; SSL, SSLv2, SSLv3, FIPS 197, Open VPN client and server; PPTP, L2TP; Cryptology: SHA-1, MD5, RSA; Encryption: DES, 3DES and AES up to 256-bit (CBC mode for IPsec).

Future Systems

All devices that are installed in the future, including, but not limited to those listed above, will be included in the maintenance contract quantities upon verification of operation.

STATEWIDE

Any supporting documentation that is needed by the Vendor to verify device locations, type, characteristics, etc. can be supplied by the Engineer at the Vendor's request. Throughout the duration of the contract, multiple ITS deployments will be installed and documentation will be provided as it becomes available. Multiple systems are currently in the design phase and documentation will be supplied as developed and approved.

ATTACHMENT B

DESCRIPTION OF A NUMBER OF PAY ITEMS AND OTHER CONTRACT ITEMS

All work shall be completed in accordance with the description of pay items and other contract items listed below.

For all line items listed below note the expectation that the associated communications network will be maintained as part of that line item. This work shall consist of the preventative maintenance, diagnosis of problems, and repairs to all components of the communications system, including, but not limited to, microwave radio links, cabling, fiber optic and SONET end equipment, microwave antennas, and cellular and RS-232/422 modems. The communication maintenance shall include all equipment, in the field or at the applicable TMC, required for communications to the field including, but not limited to, fiber optic distribution and trunk cabling, fiber optic end equipment, microwave radios, and modems.

This includes, but is not limited to the following equipment:

- Add/Drop Fiber Optic Multiplexers (Also called a Fiber Optic Network Interface),
- Video Equalization Amplifiers,
- Video Switcher Matrix,
- Ethernet Multiplexers,
- RS-422 Splitters,
- RS-232 to RS-422 Converters,
- 11 GHz Radio System,
- All Microwave Radio Antennas and Antenna Cables,
- Node Shelters,
- All Cables and Wiring Contained within a Cabinet, Node, or Hub Node
- Fiber Optic Distribution and Trunk Cabling

The preventative maintenance of the associated network components will include the following minimum preventative maintenance tasks:

- Inspect field antennas.
- Conduct path alignment tests on wireless communication links and check antenna alignment from receive and transmit end.
- Measure antenna gain.
- Measure the Voltage Standing Wave Ratio.
- Inspect fiber optic connections.

Make all adjustments, corrections, repairs, and replacements necessary to optimize the efficiency, stability, and reliability of the communications network.

PAY ITEMS

MAINTAIN CCTV SITE & BLUE WATER BRIDGE – MAINTAIN CCTV SITE

a. Description. This work shall consist of the preventative maintenance and repairs to CCTV camera sites, including camera, cabinet, camera controller, video transmitter, and all communications equipment dedicated to the individual camera sites. The existing and future CCTV systems are a hybrid of multiple communications media. The equipment for each site varies depending on the system used at the sites. The equipment in this pay item is in multiple locations, including the camera site (Field), the communications relay site (Relay), the communications node site (Node), the fiber optic communications node site (Fiber Optic Node), and at the TMC. The equipment includes, but is not limited to:

- CCTV Camera (Field)
- CCTV Camera Controller Cabinet (Field)
- CCTV Camera Pole (Field)
- CCTV Video Encoder (Field)
- Video Transmitter (Field)
- Microwave Radio (Field)
- Microwave Radio (Relay and Node)
- Video Titlers (Fiber Optic Node)
- Distribution Amplifiers (Fiber Optic Node)
- Video CODECs (Fiber Optic Node)
- CCTV Video Decoder (TMC)

b. Materials. Furnish all equipment and materials necessary to perform the required functions as documented under section 2.c. Construction Methods. Minor materials including, but not limited to, fuses, fasteners, jumper cables, cable connectors, and any wiring completely contained within the camera housing, pole or cabinet shall be included in this work. More significant materials will be provided through the spare parts inventory as described in the contract.

c. Construction Methods. For each camera site identified under Attachment A of the Log of Project, as well as for potential new camera sites added in the future, perform the following items of work at the Field site, Relay site, Node site, Fiber Optic Node site, and at the TMC end of the communications, per the approved Preventative Maintenance Plan and as indicated below:

Preventative Maintenance

Preventative maintenance shall be performed per the Vendor developed and MDOT approved preventative maintenance plan.

Repairs and Notification

Upon notification of improper operation or failure of a CCTV camera, commence with the necessary steps to repair the camera site back to proper operation. Notification shall be made via the creation of a work order by MDOT or their designee. Upon discovery of abnormal wear to the pole and/or concrete base, report

the condition by e-mail to the Engineer within one business day of discovery.

d. Measurement and Payment. The completed work, as measured at each site where this work applies, shall be paid for at the contract unit price for each applicable site for each calendar day for which the site operates above the following minimum threshold. The minimum threshold is defined as a site with none of the following unresolved reported problems:

- Loss of image or control of a camera.
- Loss of communications to a CCTV site.
- Degradation of image or control to less than 75% of optimal operation.

For this purpose, a day of not operating properly shall be defined as a day starting with the day immediately following the day the problem is reported to the Vendor. If the problem has been identified and resolved satisfactorily within the reported day, the Vendor shall be paid for that day. If the site continues to operate at or below the minimum threshold beyond the reported day, then the Vendor shall not be paid for any days after the reported day for that site until the day after the site is returned to above the minimum threshold and the work order is closed.

Contract Item	Pay Unit
Maintain CCTV Site	Calendar Day
Blue Water Bridge - Maintain CCTV Site	Calendar Day

Maintain CCTV Site Calendar Day Payment for **Maintain CCTV Site** includes all tools, labor, equipment, transportation, materials as mentioned above and other requirements necessary to maintain, diagnose, troubleshoot, and repair the CCTV sites as detailed above.

MAINTAIN DMS SITE

a. Description. This work shall consist of the preventative maintenance, diagnosis of problems, repairs and inspections of DMS sites, including the DMS, the enclosure, the structure, the controller, and all the communications equipment dedicated solely to the individual DMS sites. This item shall include the DMS LED used in connection with the Speed Warning Systems.

b. Materials. Furnish all equipment and materials necessary to perform the required functions as documented under section 3.c. Construction Methods. Minor materials including, but not limited to, fuses, fasteners, jumper cables, cable connectors, and any wiring completely contained within the cabinet, shall be included in this work. More significant materials will be provided through the spare parts inventory as described in the contract.

c. Construction Methods. For each DMS site identified under Attachment A of the Log of Project, perform the following items of work on the prescribed schedule:

Preventative Maintenance

Preventative maintenance shall be performed per the Vendor developed and MDOT approved preventative maintenance plan.

Repairs

Irregularity at a DMS site, commence with the necessary steps to repair the DMS site back to proper operation. Upon discovery of abnormal wear to the structure, enclosure, or mounting upon notification of improper operation, failure, or detection of a visible hardware, report the condition to the Engineer within one business day of discovery. Any necessary structural repairs will be done by forces outside of the contract. Structural repairs and structural painting are not included under the contract.

d. Measurement and Payment. The completed work, as measured at each site where this work applies, shall be paid for at the contract unit price for each applicable site for each calendar day the site operates above the minimum threshold. The minimum threshold is defined as a site with none of the following unresolved reported problems:

- Loss of communications to a DMS site.
- Pixel errors that fail a DMS.
- Any driver board, power supply, or module malfunctions that fail a sign.
- Failure resulting in an un-lit sign during darkness.

For this purpose, a day of not operating properly shall be defined as a day starting with the day immediately following the day the problem is reported to the Vendor. If the problem has been identified and resolved satisfactorily within the reported day, the Vendor shall be paid for that day. If the site continues to operate at or below the minimum threshold beyond the reported day, then the Vendor shall not be paid for any days after the reported day for that site until the day after the site is returned to above the minimum threshold and the work order is closed.

As an example, for a calendar day during which one DMS site is operating above the minimum threshold, the Vendor shall receive payment for one each of the Maintain DMS Site payment items.

Contract Item	Pay Unit
Maintain DMS Site	Calendar Day

Payment for **Maintain DMS Site** includes all tools, labor, equipment, transportation, materials mentioned above, and other requirements necessary to maintain, diagnose, troubleshoot, and repair the DMS sites as detailed above.

MAINTAIN DETECTOR STATION SITE

a. Description. This work shall consist of the preventative maintenance and repairs to Detector Station sites, including the cabinet and its contents, vehicle detectors, and all communications equipment dedicated solely to the individual detector station sites.

b. Materials. Furnish all equipment and materials necessary to perform the required functions as documented under section 5.c. Construction Methods. Minor materials including, but not limited to fuses, fasteners, jumper cables, cable connectors, and any wiring completely contained within the cabinet, shall be included in this work. More significant materials will be provided through the spare parts inventory as described in the contract.

c. Construction Methods. For each detector station site identified under Attachment A of the Log of Project, perform the following items of work on the prescribed schedule:

Preventative Maintenance

Preventative maintenance shall be performed per the Vendor developed and MDOT approved preventative maintenance plan.

Repairs

Upon notification of improper operation or irregularity at a detector station site, commence with the necessary steps to repair the site back to proper operation. Upon discovery of abnormal wear to the structure, enclosure, or mounting upon notification of improper operation, failure, or detection of a visible hardware, report the condition to the Engineer within one business day of discovery. Any necessary structural repairs will be done by forces outside of the contract. Structural repairs and structural painting are not included under the contract.

d. Measurement and Payment. The completed work as measured at each site where this work applies shall be paid for at the contract unit price for each applicable site for each calendar day the site operates above the minimum threshold. The minimum threshold is defined as a site with none of the following unresolved reported problems:

- Loss of communications to a detector site.
- Loop failure at 50% or more of the loops reporting to that detector site.

For this purpose, a day of not operating properly shall be defined as a day starting with the day immediately following the day the problem is reported to the Vendor. If the site is returned to above the minimum threshold within the reported day, the Vendor shall be paid for that site for that day. If the site continues to operate at or below the minimum threshold beyond the reported day, then the Vendor shall not be paid for any days after the reported day for that site.

As an example, for a calendar day during which 90 detector sites are operating above the minimum threshold, the Vendor shall receive payment for 90 each of the Maintain Detector Station Site payment items.

Contract Item
Maintain Detector Station Site

Pay Unit
Calendar Day

Payment for **Maintain Detector Station Site** includes all tools, labor, equipment, transportation, and other requirements necessary to maintain, diagnose, troubleshoot, and repair the Detector Station sites as detailed above.

MAINTAIN TRAVEL TIME SIGN SITE & MAINTAIN ICM DTBP SITE

a. Description. This work shall consist of the preventative maintenance, diagnosis of problems, repairs and inspections of TTS sites, including the Dynamic Message Panels, the enclosure, the structure, the controller, and all the communications equipment dedicated solely to the individual TTS sites.

b. Materials. Furnish all equipment and materials necessary to perform the required functions as documented under section 6.c. Construction Methods. Minor materials including, but not limited to, fuses, fasteners, jumper cables, cable connectors, and any wiring completely contained within the cabinet, shall be included in this work. More significant materials will be provided through the spare parts inventory as described in the contract.

c. Construction Methods.

Preventative Maintenance

Preventative maintenance shall be performed per the Vendor developed and MDOT approved preventative maintenance plan.

Repairs

Structural repairs will be done by forces outside of the contract. Upon notification of improper operation, failure, or detection of a visible irregularity at a TTS site, commence with the necessary steps to repair the TTS site back to proper operation.

Upon discovery of abnormal wear to the structure, enclosure, or mounting hardware, report the condition to the Engineer within one business day of discovery. Any necessary structural painting is not included under the contract.

d. Measurement and Payment. The completed work, as measured at each site where this work applies, shall be paid for at the contract unit price for each applicable site for each calendar day for which the site operates above the following minimum threshold. The minimum threshold is defined as a site with none of the following unresolved reported problems:

- Loss of communications to a TTS site.
- Pixel errors that fail a TTS.
- Any driver board, power supply, or module malfunction that fails a sign.
- Failure resulting in an un-lit sign during darkness.

For this purpose, a day of not operating properly shall be defined as a day starting with the day immediately following the day the problem is reported to the Vendor. If the site is returned to above the minimum threshold within the reported day, the Vendor shall be paid for that site for that day. If the site continues to operate at or below the minimum threshold beyond the reported day, then the Vendor shall not be paid for any days after the reported day for that site.

As an example, for a calendar day during which one TTS site is operating above the minimum threshold, the Vendor shall receive payment for one each of the Maintain Travel Time System (TTS) Site payment items.

Contract Item	Pay Unit
Maintain TTS Site	Calendar Day
Maintain ICM DTBP Sites	Calendar Day

Payment for **Maintain TTS Site** includes all tools, labor, equipment, transportation, and other requirements necessary to maintain, diagnose, troubleshoot, and repair the TTS as detailed above.

MAINTAIN SEMTOC EQUIPMENT & MAINTAIN STOC EQUIPMENT

a. Description. This work shall consist of maintaining the SEMTOC and the STOC equipment required under the contract.

The Vendor is responsible for maintaining certain components in a TOC. These components include the end equipment of the systems previously described including video monitors (in the main control room and the Emergency Operations Center at the SEMTOC), camera controllers, the 360 software and all associated components including but not limited to software, firewalls, and servers, and all cabling between the rack-mounted equipment, monitors, and controllers.

The Vendor shall replace and/or repair equipment such as monitors and video wall cubes when video quality degrades (MDOT will determine the acceptability of the video quality).

The Vendor is not responsible for maintaining the Department of Technology, Management, and Budget (DTMB) managed computer network, servers, or software at the applicable TOC.

b. Materials. Furnish all equipment and materials necessary to perform the required functions as documented under section 7 & 8.c. Construction Methods. Minor materials will be included, but not limited to, fuses, fasteners, jumper cables, cable connectors, and any wiring completely within one room. More significant materials will be provided through the spare parts inventory as described in the contract.

c. Construction Methods. For the TOC equipment including associated cabling, use a swap and repair method of maintaining full functionality of the applicable TMC equipment.

d. Measurement and Payment. The completed work as measured shall be paid for as a

lump sum.

Contract Item	Pay Unit
Maintain SEMTOC Equipment	Dollar
Maintain STOC Equipment	Dollar

Payment for **Maintain SEMTOC Equipment & Maintain STOC Equipment** includes all tools, labor, equipment, transportation, and other requirements necessary to maintain, diagnose, troubleshoot, and repair the TMC equipment as detailed above.

MAINTAIN SOLARWINDS & SOLARWINDS LICENSE RENEWAL

a. Description. This work shall consist of maintaining the Solarwinds Software required under the contract.

The Vendor will be required to maintain the three servers (one SQL, one NPM and one NCM server). This shall include backing up, dumping and backing up old logs, normal maintenance, any fixes to the servers, firewall maintenance, and any other associated server maintenance. These servers will be located at SEMTOC and are the property of MDOT.

The Vendor shall provide support, fixes, patches, and repairs to the Solarwinds, SQL Server, SQL DBA, and the monitoring network. As well as, create and maintain compatibility between Solarwinds and the ITS asset management system.

b. Materials. Furnish all equipment and materials necessary to perform the required functions as documented under section 9.c. Construction Methods. Minor materials shall be included in this work. More significant materials will be provided through the spare parts inventory as described in the contract.

c. Construction Methods. The following minimum items of work must be performed:

Preventative Maintenance

Preventative maintenance shall be performed per the Vendor developed and MDOT approved preventative maintenance plan.

Make all adjustments, corrections, repairs, and replacements necessary to optimize the efficiency, stability, and reliability of the Solarwinds Software.

The following license renewals will also be included and paid by the renewal date of May 10 unless otherwise instructed by MDOT:

NPM	\$4,995.00
NCM	\$1,499.00
IPAM	\$799.00
NTA	\$2,999.00
Three Toolsets	\$1,185.00

d. Measurement and Payment. The completed work as measured shall be paid for at the

contract unit price for each calendar day the Solarwinds Software operates above the minimum threshold. The minimum threshold is defined as having 100% functionality.

For this purpose, a day of not operating properly shall be defined as a day starting with the day immediately following when the problem is reported to the Vendor. If the problem has been identified and resolved satisfactorily within the reported day, the Vendor shall be paid for that day. If the problem persists beyond the reported day, then the Vendor shall not be paid for any days after the reported day until the system is brought back into compliance with the threshold above.

Contract Item	Pay Unit
Maintain Solarwinds Software	Calendar Day
Solarwinds License Renewal	Dollar

Payment for **Maintain Solarwinds Software & Solarwinds License Renewal** includes all tools, labor, equipment, transportation, and other requirements necessary to maintain, diagnose, troubleshoot, and repair the Solarwinds Software as detailed above.

MAINTAIN SPARE PARTS INVENTORY, SPARE PARTS DIRECT COST, & BLUE WATER BRIDGE – SPARE PARTS DIRECT COST

a. Description. This work shall consist of procuring, storing, and maintaining an inventory of ITS replacement parts at a site(s) as approved by MDOT and preparing monthly inventory tracking reports. These parts will be inventoried, audited, and may only be used in support of the contract.

b. Materials. Materials will be procured by the Vendor and compensated by MDOT on an actual cost basis.

c. Construction Methods. The Vendor shall procure and maintain an inventory of ITS replacement parts at an approved “warehouse” site. These parts will be inventoried, audited, and only utilized in support of the contract.

The Vendor shall be responsible for all aspects of the warehouse. The Vendor will be compensated for all direct costs for the spare parts material.

Upon termination of the contract, the Vendor shall be responsible for packaging, transporting, delivery, and un-packing all remaining spare parts inventory at a site as determined and directed by the Engineer. The Vendor will be responsible for any and all damages to the remaining spare parts inventory occurring during delivery.

This work shall be done by the following requirements:

1) Minimum Hardware Required

Along with the Maintenance Plan to be submitted by the Vendor as described in this proposal, the Vendor shall submit a list of equipment recommended for purchase. This list shall consist of complete units with mid to high failure rates as determined by a review of the AMD or other MDOT approved asset management

and work authorization tracking system. This quantity will not exceed 10-percent of the existing hardware. The Vendor will also submit a reasonable quantity of individual components needed to repair failed units.

The Vendor shall guarantee a percentage of operational hardware that will always be available in the warehouse as identified in the approved Maintenance Plan. The Vendor will be required to maintain this percentage of equipment for the duration of the contract, but shall never fall below 25 % of the recommended inventory.

2) Tracking of Spare Parts Inventory

The Vendor is responsible for all spare parts. Any lost or stolen items shall be replaced at the Vendor's expense. The Vendor shall track all inventory by description, serial number, location, current status, and date of status change. As existing units and parts are swapped into the inventory, these units shall also be tracked. The Vendor shall be required to track the inventory in the MDOT AMD or other MDOT approved asset management and work authorization tracking system.

In the monthly status report to MDOT, the Vendor shall submit the inventory and status of all spare parts. The reports shall summarize the units ready for deployment, units under repair, units failed and waiting for parts, and units failed but no action. The Vendor shall also provide dates when a unit status changes.

3) Security of Hardware

The Vendor shall provide the necessary security precautions for all hardware and tools purchased under the contract. The equipment is considered MDOT property loaned to the Vendor. Even though the Vendor is responsible for replacement costs, the time to replace can have an impact on overall ATMS/ATIS operations. This shall include any necessary insurance coverage.

The Vendor shall provide MDOT audit staff access to the inventory within 2-hours notification by the Engineer.

4) Warranty

Equipment provided under the contract will include the manufacturer standard warranties. All warranties will be assigned to MDOT. The Vendor will track the equipment to the warranties. The warranty information shall be updated continuously in the asset inventory database. When warranties apply, the Vendor shall coordinate with the manufacturer on all replacements. At the completion of the contract, the Vendor will provide a list of all remaining equipment warranties.

5) Purchasing Requirements

The Vendor shall obtain three bids for all parts or equipment procured, including vendor repairs, on any individual purchase exceeding \$2,500.00. The Vendor may be required to obtain three bids for any parts or equipment on any individual purchase as requested by MDOT. In the event that three bids are not able to be obtained, the Vendor shall notify MDOT in writing prior to purchasing said item. The Vendor shall maintain all bid information and furnish upon request to MDOT.

For materials approved by the Engineer for purchase as spare parts, the Vendor will be compensated for the cost of materials delivered, including tax and transportation charges.

d. Measurement and Payment. The completed work as measured for Maintain Spare Parts Inventory will be paid for at the contract unit price for each calendar day during the contract.

Contract Item	Pay Unit
Maintain Spare Parts Inventory	Calendar Day
Spare Parts Direct Cost	Dollar
Blue Water Bridge - Spare Parts Direct Cost	Dollar

Payment for **Maintain Spare Parts Inventory** includes all tools, labor, equipment, transportation, and other requirements necessary to maintain the spare parts inventory and for all record keeping, ordering replacement parts, and coordination with suppliers as detailed above.

Payment of **Spare Parts Direct Cost** is made on a direct reimbursement basis with no Vendor mark up for delivered materials upon receipt of supporting documentation.

MAINTAIN SPEED AND CURVE WARNING SYSTEMS

a. Description. This work shall consist of the preventative maintenance and repairs to Speed Warning Systems, each containing multiple sites, including the two cabinets and contents, vehicle detectors, and associated communications equipment. Preventative maintenance and repairs of the warning sign that is used by this system is included in Maintain DMS Sign Site.

b. Materials. Furnish all equipment and materials necessary to perform the required functions as documented under Construction Methods of this article. Minor materials including, but not limited to, fuses, fasteners, jumper cables, cable connectors, and any wiring completely contained within the cabinet shall be included in this work. More significant materials will be provided through the spare parts inventory as described in the contract.

c. Construction Methods. For the speed and curve warning and systems, perform the following items of work on the prescribed schedule:

d. Measurement and Payment. The completed work as measured will be paid for at the contract unit price for each day the speed warning system included in the contract is properly operational under the following contract unit item. For this purpose, a day of not operating properly shall be defined as a day starting with the day immediately following when the problem is reported to the Vendor. If the problem has been identified and resolved satisfactorily within that period, the Vendor shall be paid for that day. If the problem persists beyond that period, the Vendor will not be paid for that day, or for any days until the system is brought back into compliance with the threshold above.

If the problem persists beyond that period, the Vendor will not be paid for that day. In the event that the problem is related to an in-pavement detector failure, the site will be removed from the contract and all maintenance activities will cease until the detector is repaired and the site is operational. Repair of the in-pavement detectors will be considered out of the scope of the contract.

Contract Item

Maintain Speed and Curve Warning Systems

Pay Unit

Calendar Day

Payment for **Maintain Speed and Curve Warning Systems** includes all tools, labor, transportation, and other requirements necessary to maintain, diagnose, troubleshoot, and repair the Speed Warning System sites as detailed above.

MAINTAIN TPIMS SITE

a. Description. Truck Parking Information and Management System (TPIMS) is a system that will be developed during the lifetime of this project. TPIMS will include capabilities to measure truck parking availability at public rest areas along I-94 from the Indiana border to east of the I-69 interchange. This will measure available parking that will provide safe alternatives for parking overflow, and communicating that information to commercial vehicle operators. The responsibilities of the contract will be to maintain and repair the connectivity and equipment at the public rest areas. This will include parking availability sensing technology (detectors) and controllers, CCTVs cameras, and associated communication hardware.

This work shall consist of the preventative maintenance, diagnosis of problems, repairs and inspections of TPIMS sites, the enclosure, the structures, the controller, and all the communications equipment dedicated solely to the individual TPIMS sites.

b. Materials. Furnish all equipment and materials necessary to perform the required functions as documented under section 6.c. Construction Methods. Minor materials including, but not limited to, fuses, fasteners, jumper cables, cable connectors, and any wiring completely contained within the cabinet(s), shall be included in this work. More significant materials will be provided through the spare parts inventory as described in the contract.

c. Construction Methods.

Preventative Maintenance

Preventative maintenance shall be performed per the Vendor developed and MDOT approved preventative maintenance plan.

Repairs

Structural repairs will be done by forces outside of the contract. Upon notification of improper operation, failure, or detection of a visible irregularity at a TPIMS site, commence with the necessary steps to repair the TPIMS site back to proper operation.

Upon discovery of abnormal wear to the structure, enclosure, or mounting hardware, report the condition to the Engineer within one business day of discovery. Any necessary structural painting is not included under the contract.

d. Measurement and Payment. The completed work, as measured at each site where this work applies, shall be paid for at the contract unit price for each applicable site for each calendar day for which the site operates above the following minimum threshold. The minimum threshold is defined as a site with none of the following unresolved reported problems:

- Loss of communications to a TPIMS site.
- Any malfunction of the parking availability detection and controller, including inaccurate or loss of data.
- Loss of image or control of a camera.
- Degradation of image on control to less than 75% of optimal operation.

For this purpose, a day of not operating properly shall be defined as a day starting with the day immediately following the day the problem is reported to the Vendor. If the site is returned to above the minimum threshold within the reported day, the Vendor shall be paid for that site for that day. If the site continues to operate at or below the minimum threshold beyond the reported day, then the Vendor shall not be paid for any days after the reported day for that site.

As an example, for a calendar day during which one TPIMS site is operating above the minimum threshold, the Vendor shall receive payment for one each of the **Maintain TPIMS Site** payment items.

Contract Item

Maintain TPIMS Site

Pay Unit

Calendar Day

Payment for **Maintain TPIMS Site** includes all tools, labor, equipment, transportation, and other requirements necessary to maintain, diagnose, troubleshoot, and repair the TPIMS as detailed above.

MAINTAIN DSRC RSU SITE

a. Description. This work shall consist of the preventative maintenance and repairs to 5.9 Gigahertz (GHz) Dedicated Short-Range Communication (DSRC) Roadside Unit (RSU) sites, including radio, cabinet, antennas, and all backhaul communications equipment dedicated to the individual DSRC RSU sites. The future DSRC RSU sites are a hybrid of multiple backhaul communications media. The equipment for each site varies depending on the systems used at the sites.

This work shall consist of the preventative maintenance, diagnosis of problems, repairs and inspections of DSRC RSU sites, including but not limited to the DSRC Radios, the enclosure, the structure, the antennas, and all the communications equipment dedicated

solely to the individual DSRC RSU sites.

b. Materials. Furnish all equipment and materials necessary to perform the required functions as documented under section 6.c. Construction Methods. Minor materials including, but not limited to, fuses, fasteners, jumper cables, cable connectors, and any wiring completely contained within the cabinet, shall be included in this work. More significant materials will be provided through the spare parts inventory as described in the contract.

c. Construction Methods.

Preventative Maintenance

Preventative maintenance shall be performed per the Vendor developed and MDOT approved preventative maintenance plan.

On an annually recurring schedule, perform the following minimum preventative maintenance tasks at the communication shelters:

- Inspect field antennas.
- Check antenna alignment from receive and transmit strengths.
- Measure antenna gain.
- Inspect cable connections.

Make all adjustments, corrections, repairs, and replacements necessary to optimize the efficiency, stability, and reliability of the DSRC radio.

Repairs

Structural repairs will be done by forces outside of the contract. Upon notification of improper operation, failure, or detection of a visible irregularity at a DSRC RSU site, commence with the necessary steps to repair the DSRC RSU site back to proper operation.

Upon discovery of abnormal wear to the structure, enclosure, or mounting hardware, report the condition to the Engineer within one business day of discovery. Any necessary structural painting is not included under the contract.

d. Measurement and Payment. The completed work, as measured at each site where this work applies, shall be paid for at the contract unit price for each applicable site for each calendar day for which the site operates above the following minimum threshold. The minimum threshold is defined as a site with none of the following unresolved reported problems:

- Loss of communications to a DSRC RSU site.
- Any radio, antenna, or controller malfunction that fails a DSRC RSU site.
- Loss of ability for DSRC RSU site to transmit data between vehicles and infrastructure.

For this purpose, a day of not operating properly shall be defined as a day starting with the day immediately following the day the problem is reported to the Vendor. If the site is

returned to above the minimum threshold within the reported day, the Vendor shall be paid for that site for that day. If the site continues to operate at or below the minimum threshold beyond the reported day, than the Vendor shall not be paid for any days after the reported day for that site.

As an example, for a calendar day during which one DSRC RSU site is operating above the minimum threshold, the Vendor shall receive payment for one each of the **Maintain DSRC RSU Site** payment items.

Contract Item

Maintain DSRC RSU Site

Pay Unit

Calendar Day

Payment for **Maintain DSRC RSU Site** includes all tools, labor, equipment, transportation, and other requirements necessary to maintain, diagnose, troubleshoot, and repair the DSRC as detailed above.

MAINTAIN DTPS SITE

a. Description. This work shall consist of the preventative maintenance, diagnosis of problems, repairs and inspections of Dynamic Truck Parking Sign (DTPS) sites, including the Dynamic Message Panels, the enclosure, the structure, the controller, and all the communications equipment dedicated solely to the individual DTPS sites.

b. Materials. Furnish all equipment and materials necessary to perform the required functions as documented under section 6.c. Construction Methods. Minor materials including, but not limited to, fuses, fasteners, jumper cables, cable connectors, and any wiring completely contained within the cabinet, shall be included in this work. More significant materials will be provided through the spare parts inventory as described in the contract.

c. Construction Methods.

Preventative Maintenance

Preventative maintenance shall be performed per the Vendor developed and MDOT approved preventative maintenance plan.

Repairs

Structural repairs will be done by forces outside of the contract. Upon of improper operation, failure, or detection of a visible irregularity at a DTPS site, commence with the necessary steps to repair the DTPS site back to proper operation.

Upon discovery of abnormal wear to the structure, enclosure, or mounting hardware, report the condition to the Engineer within one business day of discovery. Any necessary structural painting is not included under the contract.

d. Measurement and Payment. The completed work, as measured at each site where this work applies, shall be paid for at the contract unit price for each applicable site for each

calendar day for which the site operates above the following minimum threshold. The minimum threshold is defined as a site with none of the following unresolved reported problems:

- Loss of communications to a DTPS site.
- Pixel errors that fail a DTPS.
- Any driver board, power supply, or module malfunction that fails a sign.
- Failure resulting in an un-lit sign during darkness.

For this purpose, a day of not operating properly shall be defined as a day starting with the day immediately following the day the problem is reported to the Vendor. If the site is returned to above the minimum threshold within the reported day, the Vendor shall be paid for that site for that day. If the site continues to operate at or below the minimum threshold beyond the reported day, then the Vendor shall not be paid for any days after the reported day for that site.

As an example, for a calendar day during which one TTS site is operating above the minimum threshold, the Vendor shall receive payment for one each of the **Maintain DTPS Site** payment items.

Contract Item

Maintain DTPS Site

Pay Unit

Calendar Day

NETWORKING SUPPORT

a. Description. This work shall consist of providing support, fixes, patches, and repairs to the network; as well as network guidance, work necessary for the compliance for projects that are tying into the current network, and participating in meetings as a technical expert as requested by the Engineer.

b. Materials. Furnish all equipment and materials necessary to perform the required functions as documented under section 9.c. Construction Methods. Minor materials shall be included in this work. More significant materials will be provided through the spare parts inventory as described in the contract.

c. Construction Methods. Make all adjustments, corrections, repairs, and replacements necessary to optimize the efficiency, stability, and reliability of the network as requested by the Engineer.

d. Measurement and Payment. The completed work as measured will be paid for at the contract unit price for the number of person hours required to support the network.

Contract Item

Networking Support

Pay Unit

Hour

Payment for **Networking Support** includes all tools, labor, equipment, transportation, and other requirements necessary to maintain, diagnose, troubleshoot, and repair the network

as detailed above.

NON-ROUTINE MAINTENANCE AND REPAIRS, BLUE WATER BRIDGE – NON-ROUTINE MAINTENANCE, & MACKINAC BRIDGE – NON-ROUTINE MAINTENANCE

a. Description. The Vendor is responsible for the routine maintenance and emergency repairs as described within the contract. Through the duration of the contract, non-routine maintenance and repairs due to Third Party Damages, Acts-of-God, and required system modifications or improvements are likely to occur that exceed the intent and scope of the contract. Third Party Damage is defined as damage caused by vehicle collision, explosions or terrorism, caused by any person or company that is not related to the prime Vendor, vendor or any subVendors involved in the contract. Acts-of-God include, but are not limited to, damages that occur resulting from winds above the equipment design speed, floods, facility fire, and lightning/electrical storms. Required system modifications or improvements will be defined as any system upgrade or modification requested by MDOT and may be requested to modernize the system technology or otherwise modify or upgrade the system.

When requested by MDOT to provide services relating to required system modifications or improvements that exceed the intent and scope of the pay items of the contract, the Vendor shall be required to develop a separate scope-of-work, define labor requirements, submit subVendors, create separate schedule and submit separate cost estimates for negotiation and/or approval. Under this step in the process, the Vendor will not be required to submit proprietary information. In the event the parties are unable to reach agreement on lump sum prices for extra work, the extra work shall be done through the process described under Force Account in the MDOT 2012 Standard Specifications for Construction.

The submission of the scope and estimate described above does not guarantee Vendor selection for the described work. The MDOT reserves the right to use this scope and estimate to obtain competitive bids for the described work. If the Vendor is selected, the Vendor may be required to submit additional information that could normally be considered proprietary information by the Vendor.

b. Authorization. If the Vendor's submission is selected as the "best value" scope and estimate, the Vendor shall not start work until a Notice-to-Proceed is executed by MDOT. The MDOT reserves the right to award the work under the contract or award the work under a different contract.

c. Disputes. The Engineer is the final authority to declare that work falls under Third Party Damage or Acts-of-God, or is out of the normal scope of the contract.

d. Compensation. Compensation for work that is deemed to be out of the normal scope of the contract, including as caused by Third Party Damage & Acts-of-God, will be developed through processes described in the MDOT Standard Specifications for Construction.

e. Measurement and Payment. The completed work as measured will be paid for in accordance with Section 109.05 (Force Account Work) of the MDOT 2012 Standard Specifications for Construction.

Contract Budget	Pay Unit
Non-Routine Maintenance and Repairs	Dollar
Blue Water Bridge - Non-Routine Maintenance	Dollar
Mackinac Bridge - Non-Routine Maintenance	Dollar

UTILITY STAKING AND PROTECTION, ONE PERSON

a. Description. This work shall consist of coordinating with MDOT staff and other MDOT consultants and Vendors to protect the ATMS/ATIS systems from damage by others. This effort will be provided whenever the Vendor is notified by other Parties, or by MDOT, of construction planned near one of the ITS equipment sites.

b. Materials. Furnish all equipment and tools necessary for clearly and properly locating and marking the ATMS/ATIS underground equipment, including conduit, direct bury cable, underground manholes and vaults, and other MDOT ATMS/ATIS equipment.

c. Construction Methods. Physically identify the location of buried ITS infrastructure. Complete the task within 72 hours of receipt of the staking request and notify the requesting Vendor and MDOT when staking is complete. This effort will be provided at both single sites, and for system buried along the right of way and not associated with a specific site. All fielded ATMS/ATIS equipment and communication infrastructure is included in this task, including infrastructure that may be added over the term of the contract.

Enter and update work order information in AMD, including hours, record of contact with requesting party, and notes as applicable for all staking requests. Field notes shall be maintained by the Vendor and provided to MDOT upon request. Mark up and modify as-built plans to indicate changes identified during staking.

d. Measurement and Payment. The completed work as measured will be paid for at the contract unit price for the number of person hours required to coordinate and mark the required underground field elements.

Contract Item	Pay Unit
Utility Staking and Protection, One Person	Hour

Payment for **Utility Staking and Protection, One Person** includes all tools, labor, equipment, transportation, and other requirements necessary to coordinate and mark the underground facilities.

MOBILIZATION

Mobilization will be paid for in accordance with Section 150 of the MDOT 2012 Standard Specifications for Construction.

OTHER CONTRACT ITEMS

TEMPORARY TRAFFIC CONTROL

Any temporary traffic control required to perform the contract work shall be approved by the Engineer before use.

All temporary traffic control items will be in accordance with Sections 812 and 922 of the MDOT 2012 Standard Specifications for Construction. All traffic control devices and their usage shall conform to the current edition of the Michigan Manual of Uniform Traffic Control Devices.

The Vendor shall notify the Engineer prior to implementing any roadway, lane, or ramp closures, so that proper notification can be given to the public.

ATTACHMENT C

ITS MAINTENANCE **SCORING POINT ASSIGNMENT**

1. PROJECT APPROACH (35 Points)

1.1. Project Management Approach.

- 15 pts: Thoroughly explained project specific management approach above expectations, custom tailored for this project.
- 10 pts: Adequately explained project management approach meets minimum expectations, well explained approach for all projects.
- 5 pts: Generic project management approach meets minimum expectations, not related to the project or subVendors.

1.2. ITS Project Maintenance.

- 10 pts: Thoroughly explained project maintenance tailored to the project, above expectations.
- 7 pts: Adequately explained project maintenance, meets minimum expectations.
- 5 pts: Generic project maintenance plan, meets minimum expectations.

1.3. Preventative Maintenance Plan.

- 10 pts: Thoroughly explained the Preventative Maintenance Plan and addressed all items in sufficient detail, including time durations.
- 7 pts: Adequately explained the Preventative Maintenance Plan and addressed all items without sufficient detail, including time durations.
- 5 pts: Generic Preventative Maintenance Plan and addressed all items in sufficient detail, including time durations.

2. PROPOSER QUALIFICATIONS (40 points)

2.1. Project Manager

- 15 pts: Project Manager shows minimum of three (3) directly related service projects in the three areas of ITS Maintenance, ITS Integration, and ITS Network Management
- 8 pts: Project Manager shows minimum of one to two (1-2) directly related service projects in the three areas of ITS Maintenance, ITS Integration, and ITS Network Management
- 0 pts: Project Manager shows no directly related service projects in the three areas of ITS Maintenance, ITS Integration, and ITS Network Management

2.2. Key Task Leader and Key Staff.

- 25 pts: Key Task Leader and Key Staff show an exceeding amount of experience

in the areas of ITS integration, installation, and corresponding electrical work. All 11 certifications are met or proposed to be met in a reasonable manner. The Vendor has a licensed electrician on staff.

15 pts: Key Task Leader and Key Staff show a minimum amount of experience in the areas of ITS integration, installation, and corresponding electrical work. 8-10 of the 11 certifications are met or proposed to be met in a reasonable manner. The Vendor has a licensed electrician on staff.

0 pts: Key Task Leader and Key Staff show no experience in the areas of ITS integration, installation, and corresponding electrical work. Less than 7 certifications are met or proposed to be met in a reasonable manner. The Vendor does not have a licensed electrician on staff.

3. PAST PERFORMANCE (20 points)

20 pts: Designated five (5) or more successfully completed projects with a minimum value of 1 million dollars per project that are relevant to the anticipated scope of work for this project. **

15 pts: Designated three to four (3-4) successfully completed projects with a minimum value of 1 million dollars per project that are relevant to the anticipated scope of work for this project. **

10 pts: Designated one to two (1-2) successfully completed projects with a minimum value of 1 million dollars per project that are relevant to the anticipated scope of work for this project. **

** Successfully completed projects will be defined through reference checks by review team.

4. LOCATION (5 points)

- | | |
|-----------------|----------|
| ▪ 95-100% | 5 points |
| ▪ 80-94% | 4 points |
| ▪ 50-79% | 3 points |
| ▪ 25-49% | 2 points |
| ▪ 10-24% | 1 point |
| ▪ Less than 10% | 0 points |

5. EVALUATION CRITERIA

Proposals will be scored using the following criteria. The Technical Proposal must score a minimum of 85 points prior to the bid being opened and scored.

Criterion Maximum Points

	Maximum Points
<u>Technical Proposal</u>	
1. Project Approach	35 pts.
▪ Project Management Approach	
▪ ITS Project Maintenance	
▪ Preventative Maintenance Plan	
2. Proposer Qualifications	40 pts.
▪ Project Manager Qualifications	
▪ Key Task Leader and Key Staff Qualifications	
3. Past Performance	20 pts.
4. Location	5 pts.
Total	100 pts.

Proposals that do not meet the requirements of the Michigan Department of Transportation Consultant/Vendor Selection Guidelines for Service Contracts will be considered non-responsive to this RFP.

ATTACHMENT D

ITS Devices and Communications Equipment

- CCTV
 - Vicon
 - Cohu
 - American Dynamics
 - Pelco
 - Videolarm
 - Kalatel
 - Axis
- DMS
 - Daktronics
 - Ledstar
 - Skyline
 - Adaptive Micro Systems
 - SESA
- MVDS
 - Wavetronix
 - image sensing system G4
 - Lantronix
- Wireless (Licensed and Unlicensed)
 - Intuicom
 - Encom
 - Proxim
 - Alvarion
 - Alcatel Lucent
 - Dragonwave
 - Firetide
 - Cambium
 - Motorola
 - Cellular Modems (Digi, Sierra)
 - Blufax Bluetooth Readers
- IP Network Equipment (Layer 2, Layer 3, Security Appliances)
 - Alcatel Lucent
 - Siemens/Ruggedcom

- Moxa
- Cisco
- Etherwan
- 3com
- GE
- Garrettcom
- Sonicwall
- Kusa
- Kyland
- Access Control
 - Honeywell Badge Readers
 - Securitron Door Jam Locks
 - GE Door Position Sensors
 - Protech Motion Sensor
 - Magal SensStar Vibration and Acoustic Sensors
 - GE Gate Closure Sensors
- Server/Equipment Control Systems
 - Solarwinds
 - Exacqvison
 - Barco
 - Transform N
 - Transform A
 - PelcoNet
 - ICX Cameleon 360
 - Crestron
 - NTCIP
 - Server Operating systems
 - - QNX (border wait)
 - Linux
 - Windows
 - InduSoft
 - Genetec Omnicast